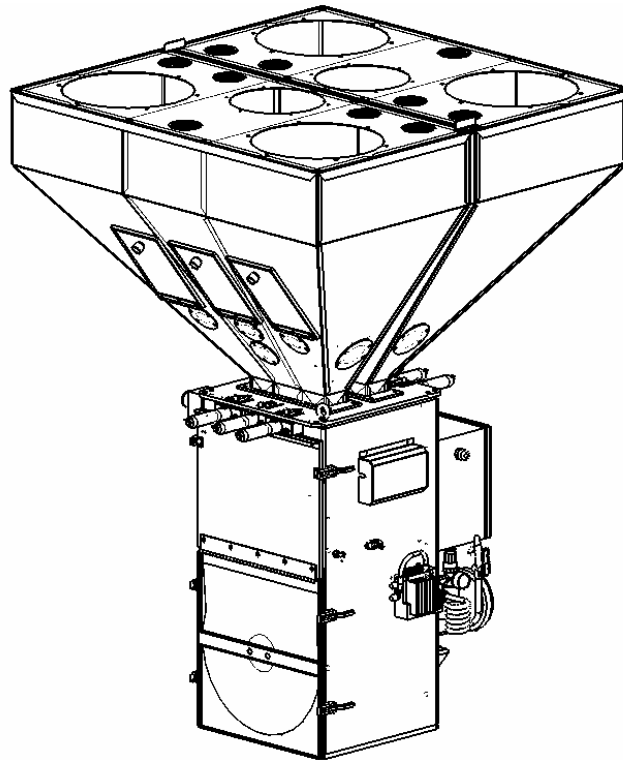# colortronic ®

Gravimetric Slide Gate Batch Blender
Mitsubishi Controller

Part Number: 882.00273.00
Bulletin Number: BF1-615.3
Effective: 11/07/07

Write Down Your Serial Numbers Here For Future Reference:

_____   _____

_____   _____

_____   _____

We are committed to a continuing program of product improvement.
Specifications, appearance, and dimensions described in this manual are subject to change without notice.

DCN No. _____

Shipping Info

Unpacking and Inspection

You should inspect your equipment for possible shipping damage.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and place of shipment.

Notify the transportation company's local agent if you discover damage.

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and to obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. In addition to the equipment itself, you should have:

- ☑ Bill of lading
- ☑ Packing list
- ☑ Operating and Installation packet
- ☑ Electrical schematic and panel layout drawings
- ☑ Component instruction manuals (if applicable)

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is Not Correct

If the shipment is not what you ordered, **contact the parts and service department immediately** at (810) 720-7300. Have the order number and item number available. *Hold the items until you receive shipping instructions.*

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the shipping department.

Credit Returns

Prior to the return of any material, **authorization** must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

ALL returned material purchased from **the manufacturer** returned is subject to 15% ($75.00 minimum) restocking charge.

ALL returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

No credit will be issued for material that is not within the manufacturer's warranty period and/or in new and unused condition, suitable for resale.

Warranty Returns

Prior to the return of any material, authorization must be given by **the manufacturer.** A RMA number will be assigned for the equipment to be returned.

Reason for requesting the return must be given.

All returns are to be shipped prepaid.

The invoice number and date or purchase order number and date must be supplied.

After inspecting the material, a replacement or credit will be given at **the manufacturer's** discretion. If the item is found to be defective in materials or workmanship, and it was manufactured by our company, purchased components are covered under their specific warranty terms.

Table of Contents

Chapter 1: Safety

1-1 How to Use This Manual

Use this manual as a guide and reference for installing, operating, and maintaining your granulator. The purpose is to assist you in applying efficient, proven techniques that enhance equipment productivity.

This manual covers only light corrective maintenance. No other maintenance should be undertaken without first contacting a service engineer.

The Functional Description section outlines models covered, standard features, and safety features. Additional sections within the manual provide instructions for installation, pre-operational procedures, operation, preventive maintenance, and corrective maintenance.

The Installation chapter includes required data for receiving, unpacking, inspecting, and setup of the blender. We can also provide the assistance of a factory-trained technician to help train your operator(s) for a nominal charge. This section includes instructions, checks, and adjustments that should be followed before commencing with operation of the blender. These instructions are intended to supplement standard shop procedures performed at shift, daily, and weekly intervals.

The Operation chapter includes a description of electrical and mechanical controls, in addition to information for operating the blender safely and efficiently.

The Maintenance chapter is intended to serve as a source of detailed assembly and disassembly instructions for those areas of the equipment requiring service. Preventive maintenance sections are included to ensure that your blender provides excellent, long service.

The Troubleshooting chapter serves as a guide for identification of most common problems. Potential problems are listed, along with possible causes and related solutions.

The Appendix contains technical specifications, drawings, schematics, parts lists, and available options. Refer to this section for a listing of spare parts for purchase. Have your serial number and model number ready when ordering.

Safety Symbols Used in this Manual

The following safety alert symbols are used to alert you to potential personal injury hazards. Obey all safety messages that follow these symbols to avoid possible injury or death.

DANGER!   *DANGER indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.*

WARNING!   *WARNING indicates a potentially hazardous situation or practice that, if not avoided, could result in death or serious injury.*

Caution!   *CAUTION indicates a potentially hazardous situation or practice that, if not avoided, may result in minor or moderate injury or in property damage.*

Figure 1: Safety Tags and Warning Labels

Tag	Description	Tag	Description
	Pinch Point Slide Gate		Read Operation & Installation Manual
	Shear Point Rotating Mixer		Earth Ground
	High Voltage Inside Enclosure	PE	Protected Earth Ground
	Shear Hazard Rotating Auger		Lifting Point

1-2   Warnings and Precautions

Our equipment is designed to provide safe and reliable operation when installed and operated within design specifications, following national and local safety codes. This may include, but is not limited to OSHA, NEC, CSA, SPI, and any other local, national and international regulations.

To avoid possible personal injury or equipment damage when installing, operating, or maintaining this equipment, use good judgment and follow these safe practices:

- ☑ **Read and follow these operation and installation instructions when installing, operating, and maintaining this equipment. If these instructions become damaged or unreadable, additional copies are available from the manufacturer.**

- ☑ Follow all **SAFETY CODES**.

- ☑ Keep fingers away from slide gates, augers, clean-outs, and calibration hatches. Automatic operation may start unexpectedly, **A PINCH HAZARD CAPABLE OF CAUSING BODILY INJURY EXISTS ANY TIME THE POWER IS ON.**

- ☑ Wear **SAFETY GLASSES** and **WORK GLOVES**.

- ☑ Work only with approved tools and devices.

- ☑ Disconnect and/or lock out power and compressed air before servicing or maintaining the equipment.

- ☑ Use care when **LOADING**, **UNLOADING**, **RIGGING**, or **MOVING** this equipment.

- ☑ Operate this equipment within design specifications.

- ☑ **OPEN**, **TAG**, and **LOCK ALL DISCONNECTS** before working on equipment. You should remove the fuses and carry them with you.

- ☑ **NEVER PUT FINGERS OR TOOLS IN AN AUGER OR SLIDE GATE AREA.**

- ☑ Make sure the equipment and components are properly **GROUNDED** before you switch on power.

- ☑ Do not restore power until you remove all tools, test equipment, etc., and the equipment and related components are fully reassembled.

- ☑ Only **PROPERLY TRAINED** personnel familiar with the information in this manual should work on this equipment.

We have long recognized the importance of safety and have designed and manufactured our equipment with operator safety as a prime consideration. We expect you, as a user, to abide by the foregoing recommendations in order to make operator safety a reality.

1-3   Responsibility

These machines are constructed for maximum operator safety when used under standard operating conditions and when recommended instructions are followed in the maintenance and operation of the machine.

All personnel engaged in the use of the machine should become familiar with its operation as described in this manual.

Proper operation of the machine promotes safety for the operator and all workers in its vicinity.

Becoming familiar with materials, inspection, speed limitations, screens, and guard maintenance and total user responsibility will assist you in learning potential areas in need of observation for danger.

Each individual must take responsibility for observing the prescribed safety rules as outlined. All caution, warning and danger signs must be observed and obeyed. All actual or potential danger areas must be reported to your immediate supervisor.

General Responsibility

No matter who you are, safety is important. Owners, operators and maintenance personnel must realize that every day, safety is a vital part of their jobs.

If your main concern is loss of productivity, remember that production is always affected in a negative way following an accident. The following are some of the ways that accidents can affect your production:

- Loss of a skilled operator (temporarily or permanently)
- Breakdown of shop morale
- Costly damage to equipment
- Downtime

An effective safety program is responsible and economically sound.

Organize a safety committee or group, and hold regular meetings. Promote this group from the management level. Through this group, the safety program can be continually reviewed, maintained, and improved. Keep minutes or a record of the meetings.

Hold daily equipment inspections in addition to regular maintenance checks. You will keep your equipment safe for production and exhibit your commitment to safety.

Please read and use this manual as a guide to equipment safety. This manual contains safety warnings throughout, specific to each function and point of operation.

Operator Responsibility

The operator's responsibility does not end with efficient production. The operator usually has the most daily contact with the equipment and intimately knows its capabilities and limitations.

Plant and personnel safety is sometimes forgotten in the desire to meet incentive rates, or through a casual attitude toward machinery formed over a period of months or years. Your employer probably has established a set of safety rules in your workplace. Those rules, this manual, or any other safety information will not keep you from being injured while operating your equipment.

Learn and always use safe operation. Cooperate with co-workers to promote safe practices. Immediately report any potentially dangerous situation to your supervisor or appropriate person.

REMEMBER:

- **NEVER** place your hands or any part of your body in any dangerous location.

- **NEVER** operate, service, or adjust the blender without appropriate training and first reading and understanding this manual.

- **NEVER** try to pull material out of the blender with your hands while it is running!

Before you start the blender check the following:

- Remove all tools from the unit;

- Be sure no objects (tools, nuts, bolts, clamps, bars) are laying in the metering or mixing area;

    Note: **If your blender has been inoperative or unattended, check all settings before starting the unit.**

    Note: **At the beginning of your shift and after breaks, verify that the controls and other auxiliary equipment are functioning properly.**

    Note: **Keep all safety guards in place and in good repair. NEVER attempt to bypass, modify, or remove safety guards. Such alteration is not only unsafe, but will void the warranty on your equipment.**

    Note: **When changing control settings to perform a different mode of operation, be sure selector switches are correctly positioned. Locking selector switches should only be adjusted by authorized personnel and the keys removed after setting.**

Report the following occurrences **IMMEDIATELY:**

- unsafe operation or condition

- unusual blender action

- leakage

- improper maintenance

    Note: **NEVER stand or sit where you could slip or stumble into the blender while working on it.**

    Note: **DO NOT wear loose clothing or jewelry, which can be caught while working on an blender. In addition, cover or tie back long hair.**

    Note: **Clean the blender and surrounding area DAILY, and inspect the machine for loose, missing or broken parts.**

    Note: **Shut off power to the blender when it is not in use. Turn the switch to the OFF position, or unplug it from the power source.**

Maintenance Responsibility

Proper maintenance is essential to safety. If you are a maintenance worker, you must make safety a priority to effectively repair and maintain equipment.

Before removing, adjusting, or replacing parts on a machine, remember to turn off all electric supplies and all accessory equipment at the machine, and disconnect and lockout electrical power. Attach warning tags to the disconnect switch.

When you need to perform maintenance or repair work on a blender above floor level, use a solid platform or a hydraulic elevator. If there is a permanently installed catwalk around your blender, use it. The work platform should have secure footing and a place for tools and parts. **DO NOT** climb on unit, machines, or work from ladders.

If you need to repair a large component, use appropriate handling equipment. Before you use handling equipment (portable "A" frames, electric boom trucks, fork trucks, overhead cranes) be sure the load does not exceed the capacity of the handling equipment or cause it to become unstable.

Carefully test the condition of lifting cables, chains, ropes, slings, and hooks before using them to lift a load.

Be sure that all non-current carrying parts are correctly connected to earth ground with an electrical conductor that complies with current codes. Install in accordance with national and local codes.

When you have completed the repair or maintenance procedure, check your work and remove your tools, rigging, and handling equipment.

Do not restore power to the blender until all persons are clear of the area. **DO NOT** start and run the unit until you are sure all parts are functioning correctly.

BEFORE you turn the blender over to the operator for production, verify all enclosure panels, guards and safety devices are in place and functioning properly.

Reporting a Safety Defect

If you believe that your equipment has a defect that could cause injury, you should immediately discontinue its use and inform the manufacturer.

The principle factors that can result in injury are failure to follow proper operating procedures (i.e. lockout/tagout), or failure to maintain a clean and safe working environment.

Chapter 2: Functional Description

2-1 Models Covered in This Manual

This manual provides operation, installation, and maintenance instructions for slide gate blenders of various blending rates and specifications. See below for a list of available models.

- 150 lbs/hr Slide Gate Batch Blender with Mitsubishi Controls

- 500 lbs/hr Slide Gate Batch Blender with Mitsubishi Controls

- 900 lbs/hr Slide Gate Batch Blender with Mitsubishi Controls

- 2500 lbs/hr Slide Gate Batch Blender with Mitsubishi Controls

- 4000 lbs/hr Slide Gate Batch Blender with Mitsubishi Controls

- 6000 lbs/hr Slide Gate Batch Blender with Mitsubishi Controls

Model numbers are listed on the serial tag. Make sure you know the model and serial number of your equipment before contacting the manufacturer for parts or service.

Blending systems are as varied as the applications they service. All slide gate blenders are sized to meet the specific requirements stated by the Customer at the time of purchase.

2-2 General Description

All blenders are designed to blend plastic pellets and regrind, and supply the blended material to the processing machine. Standard equipment is not designed to blend powder or any other materials.

Accessories

The manufacturer offers a variety of standard options for blenders including floor stands, RAM feeders, loading equipment, etc. All accessories are designed and manufactured to ensure proper results for your application.

Customer Service

The intent of this manual is to familiarize the operator and maintenance personnel with these blenders and help your organization get the maximum service from your equipment. If you have any questions regarding installation, service, repair, custom equipment, or applications, please do not hesitate to contact us for the information required. Prices for additional equipment, accessories, or repair parts will be furnished promptly upon request.

> Note: **If you desire to use a blender for an application other than that for which it was purchased, please contact your sales representative or our factory to verify compatibility of the equipment with the new process. Misapplication of the equipment could result in injury to the operator or damage to the equipment.**

Figure 2: Equipment Specifications

Dimensions and Specifications		150	500	900	2500	4000	6000
Maximum Blending Rate, lbs/hr (kgs/hr) (3)		150 (68)	500 (227)	900 (410)	2500 (1135)	4000 (1815)	6000 (2725)
Number of Materials to be Blended		2 to 4	2 to 6	2 to 8			
Slide Gate Size - Majors, in. (mm)		2.0 (50)	2.0 (50)		2.5 (63)	4.0 (102)	
Slide Gate Size - Minors, in. (mm)		1.5 (38)	1.5 (38)		2.0 (50)	3.0 (76)	
Supply Hopper Capacity - Majors, cu.ft. (l.) (4)		0.7 (20)	2.5 (70)		5.2 (145)	14.3 (400)	
Supply Hopper Capacity - Minors, cu.ft. (l.) (4)		0.2 (5)	1.8 (50)		3.6 (100)	10.2 (285)	
Weigh Hopper Capacity, cu.ft. (l.)		0.07 (2)	0.18 (5)	0.38 (11)	0.82 (23)	1.23 (34)	2.17 (61)
Typical Batch Size, lbs. (kgs)		1.5 (0.7)	4 (1.8)	8 (3.6)	25 (11.3)	35 (15.8)	45 (20.4)
Load Cell Capacity, kgs		1 @ 5 kg	2 @ 3 kg	2 @ 5kg	2 @ 10 kg	2 @ 15 kg	2 @ 20 kg
Mixer Capacity, cu.ft. (l.)		0.18 (5)	0.25 (7)	0.56 (16)	1.1 (31)	2.72 (77)	
Mixer Motor Size, HP (kw)		1/8 (0.09)	1/6 (0.124)		1/3 (0.248)		
Mixer RPM		42	21		22		
Blended Material Discharge Opening, in. (mm)		2.5 (63)	3.0 (76.2)		4.0 (102)		
Weight of Machine (approx.), lbs. (kgs)		250 (115)	375 (170)	450 (205)	650 (295)	1100 (500)	
Shipping Weight (approx.), lbs. (kgs)		350 (160)	475 (215)	550 (250)	800 (360)	1300 (590)	
Approximate Dimensions, in. (mm)	Height (5)	34.5 (875)	51.5 (1308)	56.5 (1435)	69.5 (1765)	85.5 (2172)	89.5 (2273)
	Width (5)	26.0 (650)	37.5 (952)	37.0 (940)	45.5 (1156)	57.5 (1461)	
	Depth (5)	22.0 (560)	37.0 (940)	40.0 (1016)	46.5 (1181)	57.0 (1448)	

(1) Blender models with 7th and 8th component metering include Allen Bradley 10 inch color touch screen standard.

(2) Compressed air loaders cannot be used to load 150 # blenders.

(3) See page 2 for important rate information concerning each model's maximum blending rate.

(4) Hopper capacity measured as level full volume. Capacity reduced when loaded automatically.

(5) Measurements describe standard unit without feeder or R.A.M. hoppers.

Figure 3: Typical Blender Assembly
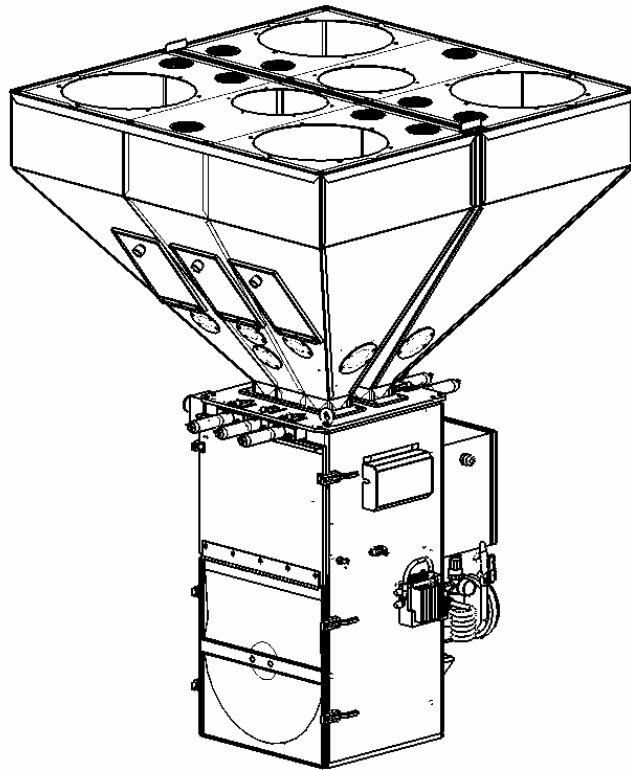
2-3   Typical Features and Components

Mechanical Features

- Exclusive diamond design slide gate metering assemblies meter a large range for free flowing pellet materials

- Adjustable Slide gate stroke limiting restrictors provided for accurate metering of minor ingredients (not on 150#)

- Removable Stainless steel weigh hopper and mixing components

- Powder Coated Mild steel material supply hoppers with machined polycarbonate clean-out doors and optional material drains (stainless steel on 150#)

- Precision 1/10% span accurate cantilever load cell weighing system

- Interlocked safety system shuts off compressed air **and** electricity if mixer is opened

- Compressed air hose with nozzle for clean-out

Figure 4: Typical Mitsubishi Controller Touch Screen Display

> **Note:**   **The touch-screen panel display on your unit may be slightly different than shown.**

Controller Features

- LCD touch-screen interface display operator control panel with 32' cable

- Target vs. actual set point verification

- Inventory accumulation for all ingredients

- Audible and visual alarms

- Auxiliary alarm contact

- 50 recipe storage book

- Three (3) types of recipe entry procedures available:
    - **Quickset mode** (up to 6-component) recipe entry. Color and additives are metered as a percentage of the virgin material.
    - **Percentage mode** recipe entry. Ingredients are metered as a percentage of the overall batch.
    - **Parts mode** recipe entry (i.e. 500:1) Ingredients are metered as a ratio to each other within the batch
- Full control diagnostics
- Serial printer and RS-485 communications ports

System Component Description

This section describes the various components of the blending system.

Supply Hoppers

The material supply hoppers are located on top of the blender frame. These hoppers store a supply of material for the individual metering devices. They are sized based on the total throughput of the blender.

The blending system does not include any level indication devices on the unit. Optional low-level sensors are available. The blender controller <u>will</u> alarm if it runs out of material while trying to make a batch, but low-level sensors will alert floor personnel to the problem sooner.

Each hopper is equipped with a sight glass and/or access door.

Figure 5: Typical Hopper Assembly
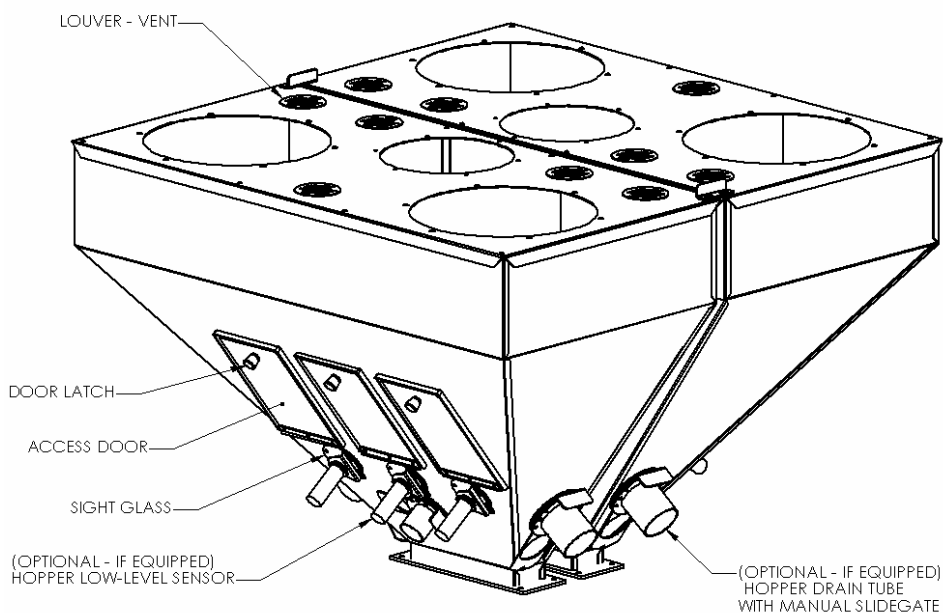
Slide Gates

Air operated slide gates are provided to meter the majority of pellet ingredients on Slide Gate blenders.

> Note: **The metering range assumes 1/8" diameter free-flowing plastic pellets weighing approximately 35 lbs./cu. ft. This is meant to be an approximate sizing recommendation and can vary with different bulk density resins, pellet configuration, etc.**

A stroke limiter (included) can be installed on the metering gates to limit their travel. This device decreases the stroke of the gate and reduces the metering orifice of the valve. The unique diamond gate provides a square opening at any stroke length, providing more consistent flow from smaller valve openings than conventional slide gates. This stroke limiter may be necessary to accurately meter low percentage ingredients.

The air cylinders operating the slide gate are rugged, stainless steel cylinders designed for industrial use.

> Note: **The unique diamond gate provides a constant aspect opening that remains square regardless of the stroke length of the cylinder. This design provides a wider cross sectional opening when approaching a closed position, and provides better flow of plastic pellets out of the opening.**
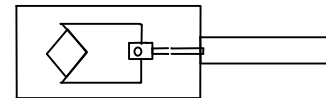
DIAMOND GATE OPEN
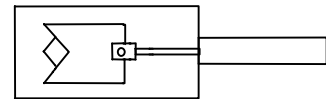
DIAMOND GATE 1/2 CLOSED
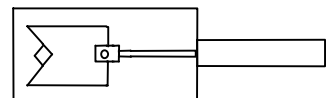
DIAMOND GATE 3/4 CLOSED
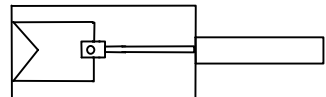
DIAMOND GATE CLOSED

WARNING! *Slide gates create a pinch-point hazard.*

WARNING! *Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any blender, including all Slide Gate/Auger models. Failure to do so may result in serious injury.*

Figure 6: Typical Slide Gate Assembly
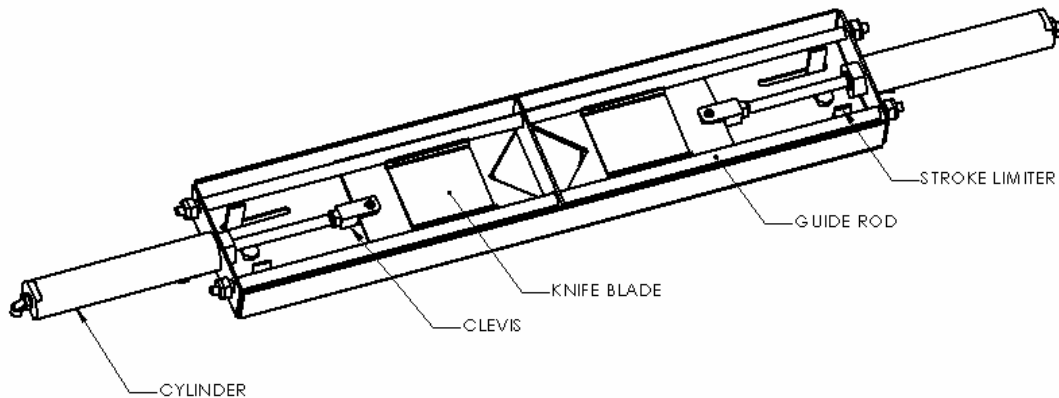
Each of the diamond gate air cylinders is actuated by a solenoid valve, which are controlled by the blender controller.

When the solenoid valve is energized, it opens the metering valve cylinder. When the solenoid valve is de-energized, it closes the metering valve cylinder.

If the power is interrupted to the blender, the metering valves will return to the closed position, to prevent material from over-filling the weigh hopper/mix chamber.

> **Note:** **If the blender is in metering mode with one of the slide gates open, do not open the front door of the blender!**

> **Note:** **The safety switch shuts off the air supply to the blender. An open feeder slide gate stays open, and an overflow of the weigh hopper can occur!**

Weigh Hopper

The weigh hopper on the Slide Gate/Auger blender is used to weigh each batch of material, and includes an air-operated discharge valve. After the batch is weighed and the level sensor in the lower mix section is uncovered, the valve will open and discharge the batch into the mixer with the existing blended material. The discharge valve is also provided with a quick disconnect so the weigh hopper can be removed for cleaning.

On a Slide Gate blender, the weigh hopper rests on each side on a precision cantilever load cell. To remove the weigh hopper, lift the hopper from the bottom, hold the dump door closed, and slide it out once clear of the locating tab on the bracket above the load cell.

Once the hopper has been cleaned, reposition it onto the load cell brackets, using care not to damage the load cells. Position the hopper as close to the center position between the load cells as possible.

> **Note:** **Use care when replacing the weigh hopper, since the load cells are delicate weighing instruments and can be easily damaged. Do not use force to push in the weigh hopper. If it is positioned properly, it will slide in very easily.**

> **Note:** **Load cells, if damaged, will have to be sent back to the manufacturer for testing and evaluation.**

Figure 7: Typical Weigh Hopper Assembly
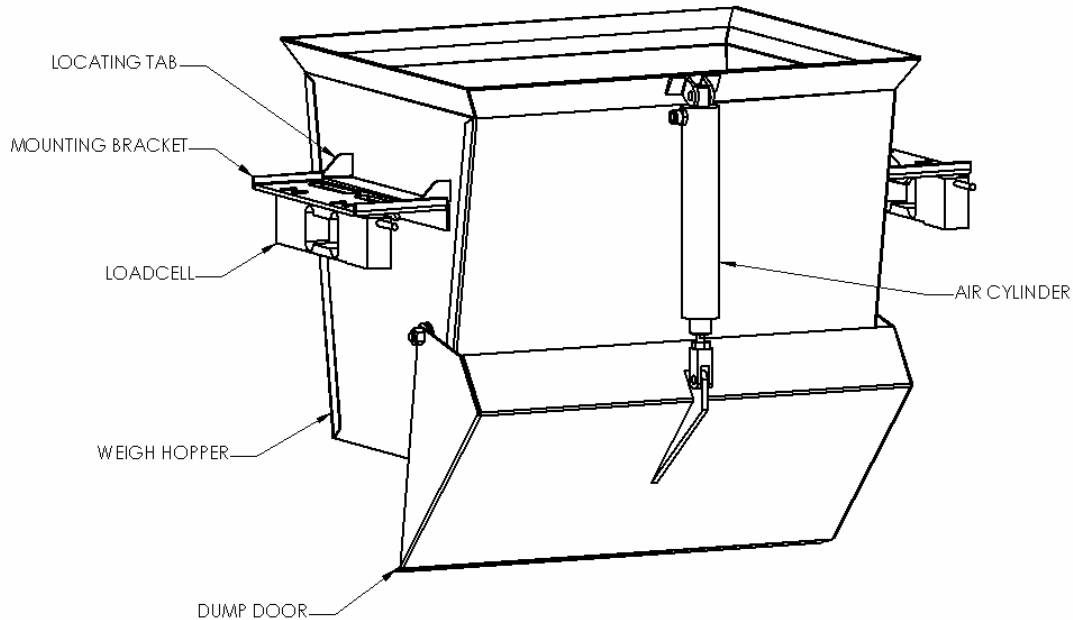
The weigh hopper dump door holds the material until it is dumped into the mixing section. The cylinder is actuated by a solenoid in the valve stack on the side of the blender.

In looking at the pneumatic circuit, you can see that the air regulator controls the flow of air to the valve stack.   When the weigh hopper discharge cylinder solenoid valve is not electrically energized, it will provide air pressure to the air cylinder and hold the shaft in an extended position, holding the dump valve closed.

When the air cylinder is actuated, the air pressure to the dump valve will be removed, causing it to open.

The air cylinder on the weigh hopper includes a spring return to allow the cylinder to retract in the absence of air pressure on the cylinder. This will cause the dump valve to open.

Caution! *The pneumatic system used on the Slide Gate blender, like all pneumatic systems, is highly sensitive to oily, dirty, wet or contaminated air. If oil, dirt, water, or any other air-borne contaminates enter the system, the components could be damaged and injury to the operator could result. A proper air supply must be supplied to the blender.*

When the safety circuit is disabled, the air pressure to the cylinder will drop off by shutting off all the air supply to the valve stack with the pilot operated master air valve. This will also cause the weigh hopper discharge door to open.

Mix Chamber

All of the batch blenders are equipped with an integral mix chamber. The mix chamber holds multiple batches of material so any variations in a batch are averaged over time.

Figure 8: Typical Mixer Assembly
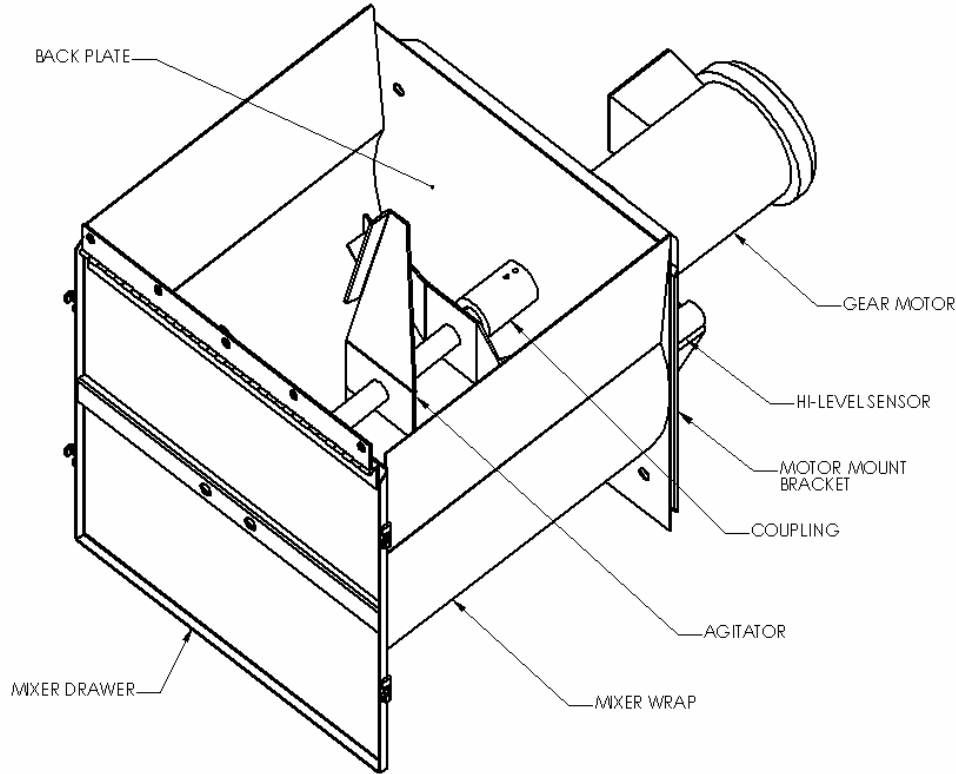
The Opti-mixer™ is designed to provide bi-directional mixing action and can be easily taken apart for cleaning. This design is standard on all Slide Gate blenders.

Operator Control Panel Display

The operator control panel includes a 32 foot (10.0 m) cable and can be remote mounted (not recommended) adjacent to the blender. The panel can be unplugged and removed if necessary.

A programmable logic controller (PLC) controls the blender operation. This design provides excellent blender performance along with an easily replaceable control panel in the unlikely failure of any computer or electronic part.

The display menu format is very simple. After installation and setup, simply enter in the recipe and start the blender. See figures 10, 11 and 12 for controller pushbutton & touchscreen tags along with typical setup and operator screens.

If it is desired to have a local display and control of the blender closer to a remote operator station, an optional remote mount operator panel is available.

Figure 9: Typical Mitsubishi Controller Touch Screen Display

> Note: The touch-screen panel display on your unit may be slightly different than shown.

Figure 10: Controller Pushbuttons & Touchscreen Tags
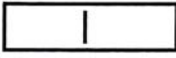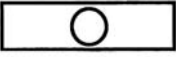
Button	Function
☐ I ☐ (Power On)	Turns power on to the blender controller. (Found on the back of the controller.)
☐ O ☐ (Power Off)	Turns power off to the blender controller. (Found on the back of the controller.)
Abort	Stops blender & restarts controller.
Done	Press to move back one screen level in controller function.
Next	Move forward one screen level in controller function.
Push to Start or Stop	Start (or stop) blender with current program parameters.
Erase / Erase All	Can erase current settings for one recipe or all recipes.
The blender has reached the inventory shutdown amount and has been stopped. Restart Blender / Stop Blender	Stops blender operation after current inventory shutdown (if used) is completed (This screen will be displayed.)

Figure 11: Typical Operator Screens

Figure 12: Typical Setup Screens
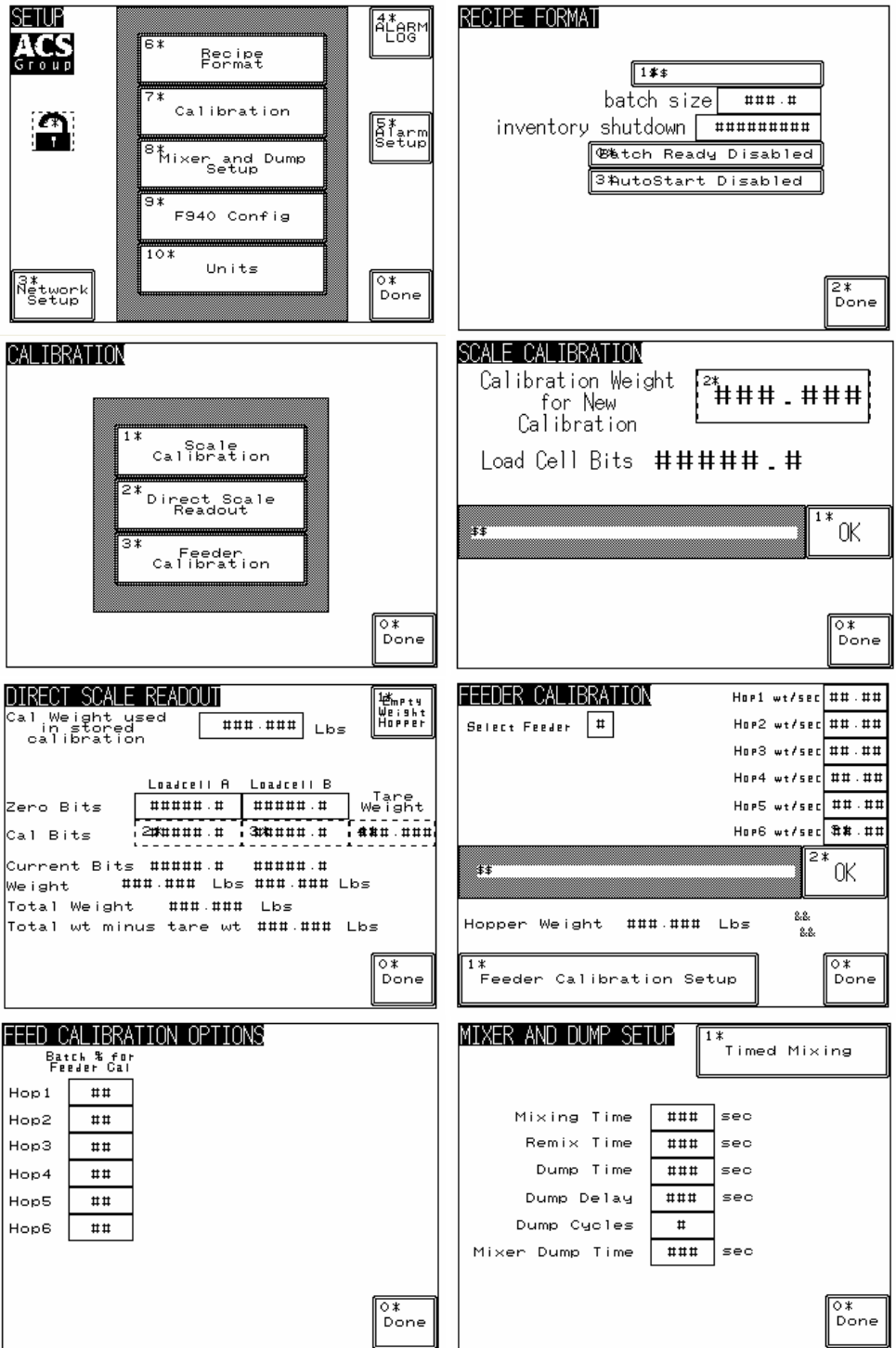
F940 CONFIG

```
        ┌──────────────────────┐
        │ 1*                   │
        │ F940 Config Screen   │
        │                      │
        └──────────────────────┘

F940 Version: Main 1.4
PLC Blender Version: ####.#

┌────────────┐
│ 2*Set F940 │
│ Date & Time│
└────────────┘
                              ┌──────┐
                              │ 0*   │
                              │ Done │
                              └──────┘
```

UNITS

```
┌────────────────────────────────┐
│     Blender Data in Kgs.        │
├────────────────────────────────┤
│  Display Target/Actual in Lbs.  │
└────────────────────────────────┘

*NOTE:  If "Blender Data" is
changed from either KGS or
LBS you must recalibrate the
     blender and reset the
inventory totals.  You must
also check inventory shutdown
     levels and batchsize

                         ┌──────┐
                         │ Done │
                         └──────┘
```

```
▶ ■MM/DD/YY 1H:MM:SS PM A NEW RECIPE HAS
   BEEN ACCEPTED




┌───────┬───────┬─────┬─────┬─────┬──────┐
│ Clear │ Print │  ▲  │  ▼  │     │ Done │
└───────┴───────┴─────┴─────┴─────┴──────┘
```

ALARM FLAGS & FEEDER SETUP

```
                                    ┌────┐
              Select Feeder         │ ## │
                                    └────┘

┌───────────────────────────────┐  ┌──────────┐
│$$                             │  │ 1$hange  │
├───────────────────────────────┤  ├──────────┤
│$$                             │  │ 2$hange  │
└───────────────────────────────┘  └──────────┘

         Out of
        Material       ┌────────┐
  Alarm Silence        │ 3#I#I# │
         Delay         └────────┘
                                   ┌──────┐
                                   │ 0*   │
                                   │ Done │
                                   └──────┘
```

ETHERNET SETUP

```
       ┌────────────────────────────┐
       │ 1*Communications Disabled  │
       └────────────────────────────┘

       ┌────────────────────────────┐
       │ Communications is used for remote │
       │ communications to the blender. This │
       │ must be disabled if you wish to use │
       │ the port for printing.  You must reboot │
       │ the PLC after making changes to this │
       │         parameter.          │
       └────────────────────────────┘

                              ┌──────┐
                              │ 0*   │
                              │ Done │
                              └──────┘
```

2-4   Optional Components

The following is a list of options, which your blender may have been equipped with:

Pneumatic Slide Gate below Mixer

The Slide Gate/Auger blending system can be equipped with an <u>optional</u> pneumatic slide gate below the mixing chamber. The gate is used in applications when the blender is mounted above a large hopper, or for gaylord filling, etc. This gate holds the material in the mixing section, to ensure that it is properly mixed. Control of the mixer function is described below, and is determined by the position of the "knife gate switch" located on the side of the back control panel.

WARNING!   Slide gates create a pinch-point hazard.

Figure 13: Mixer Slide Gate Switch Positions

Position	Description
AUTO	Slide gate functions are automatically controlled by the blender controller
OPEN	Slide gate open all the time
CLOSE	Slide gate closed all the time

Low Level Sensors

Detects material supply problems before blender supply hoppers are empty.

Mezzanine and Floor Stands

Supports blenders in mezzanine mount and freestanding applications.

Figure 14: Typical Floor Stands (Surge Hopper Stand & Gaylord Fill Stand)
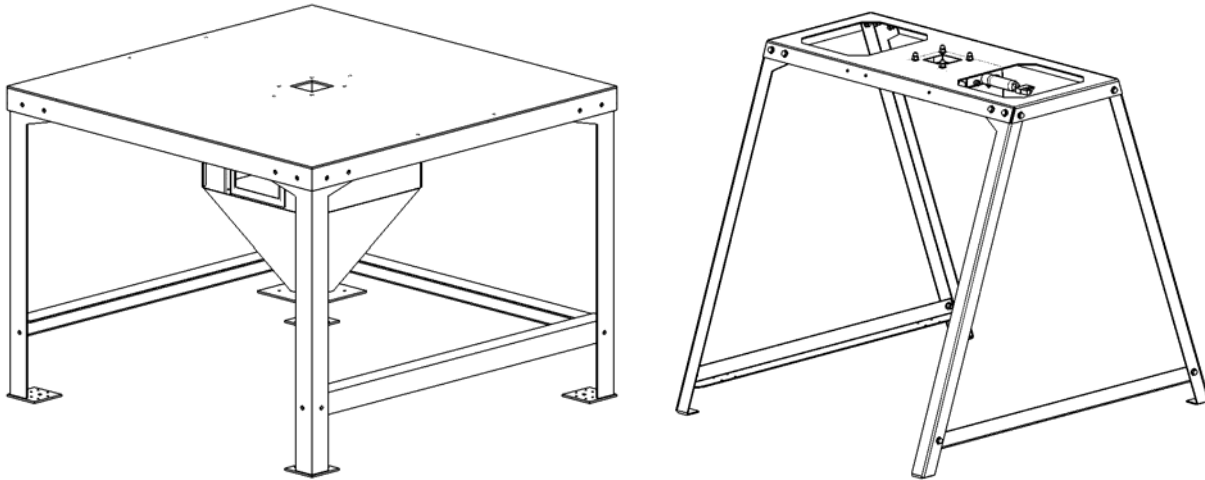
Regrind Auger Metering (R.A.M.) Hopper

Used for feeding difficult regrind materials.

Figure 15: Typical R.A.M. Hopper Blender Configuration
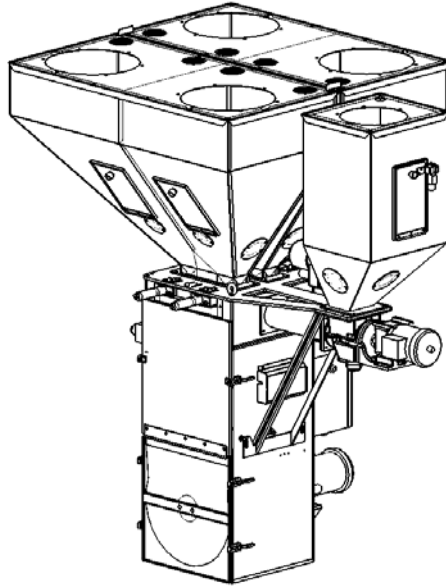
Additive Feeder Hopper

Used for feeding pelletized additive, typically used on blenders with more than six components.

Figure 16: Typical Additive Feeder Configuration
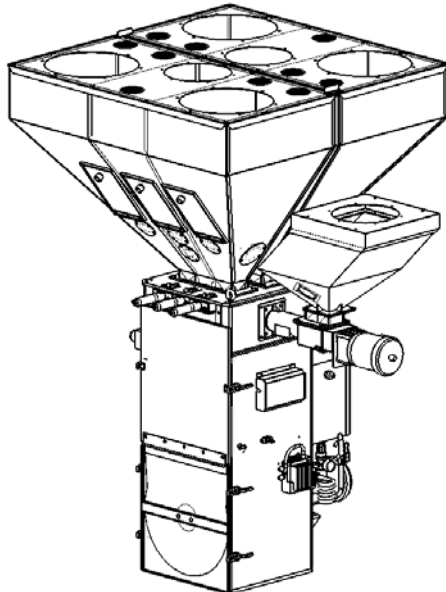
Take-off Compartments

Allows material to be metered into a vacuum conveying system.

2-5   Safety Features

This section includes information on safety devices and procedures that are inherent to the Gravimetric Batch Blender. This manual is not intended to supersede or alter safety standards established by the user of this equipment. Instead, the material contained in this section is recommended to supplement these procedures in order to provide a safer working environment.

At the completion of this section, the operator and maintenance personnel will be able to do the following:

- Identify and locate specific safety devices.

- Understand the proper use of the safety devices provided.

- Describe the function of the safety device.

Safety Circuit Standards

Safety circuits used in industrial systems protect the operator and maintenance personnel from dangerous energy. They also provide a means of locking out or isolating the energy for servicing equipment.

Various agencies have contributed to the establishment of safety standards that apply to the design and manufacture of automated equipment. The Occupational Safety and Health Administration (OSHA) and the Joint Industrial council (JIC) are just a few of the organizations that have joined with the plastics industry to develop safety standards.

Every effort has been made to incorporate these standards into the design of the Slide Gate/Auger Blender; however, it is the responsibility of the personnel operating and maintaining the equipment to familiarize themselves with the safety procedures and the proper use of any safety devices.

Fail Safe Operation

If a safety device or circuit should fail, the design must be such that the failure causes a "Safe" condition. As an example, a safety switch must be a normally open switch. The switch must be held closed with the device it is to protect. If the switch fails, it will go to the open condition, tripping out the safety circuit.

At no time should the safety device fail and allow the operation to continue. For example, if a safety switch is guarding a motor, and the safety switch fails, the motor should not be able to run.

Safety Device Lock-Outs

Some safety devices disconnect electrical energy from a circuit. The safety devices that are used on the Slide Gate/Auger Blenders are primarily concerned with pneumatic and electrical power disconnection and the disabling of moving parts that may need to be accessed during the normal operation of the machine.

Some of the safety devices utilize a manual activator. This is the method of initiating the safety lock out. This may be in the form of a plug, lever or a handle. Within this lockable handle, there may be a location for a padlock. Personnel servicing the equipment should place a padlock in the lockout handle.

In addition to the safety devices listed above, these blenders are equipped with a line cord plug (Shown in figures 17 and 18). This allows the operator or maintenance personnel to

unplug the unit from its power source and tag it out. The plug can then be tagged with any number of approved electrical lockout tags available at most electrical supply stores.

Figure 17: Electrical Disconnect Plug

POWER RECEPTACLE

8 ft (2.4m)
POWER CORD
AND PLUG

5.2 ft (1.6 m)
MAXIMUM HEIGHT

NOTE:
DISCONNECT POWER WHEN
CLEANING OR SERVICING
BLENDER
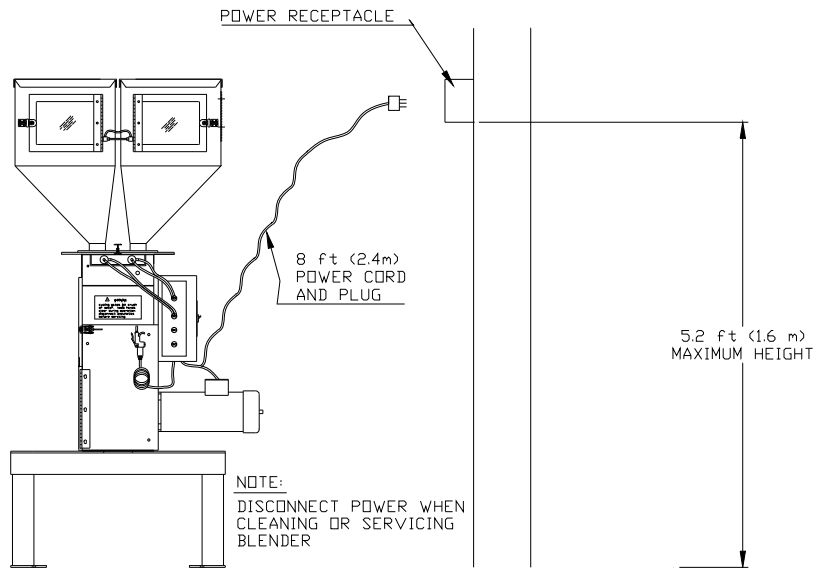
Twist Cap Plug Connected to Each Feeder Auger Motor

The cap plug must be turned counter-clockwise to loosen and the female end of the cord removed from the motor plug. This disables the motor from turning while the auger unit is being serviced or cleaned. The motor cords are cut to length so they must be disconnected before the auger can be removed from the housing. Disconnect plug before cleaning or servicing motors or augers.

Figure 18: Twist Cap Plug

**Unscrew and remove plug
from motor**

Motor
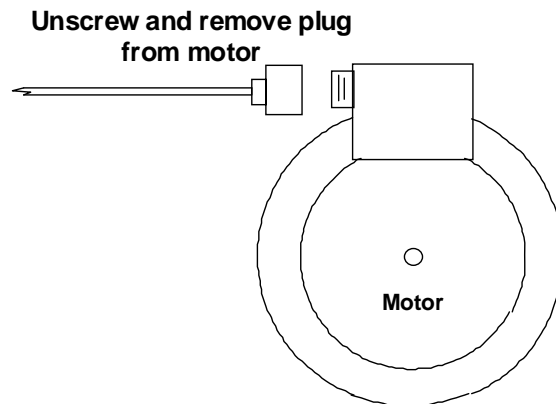
Electric Safety Interlock Switch

A unique electric safety switch is used to shut off power to the blender any time the mixer door is opened. Do not alter or tamper with this switch in any way.

Figure 19: Electrical Safety Interlock Switch (Located on mixer door)
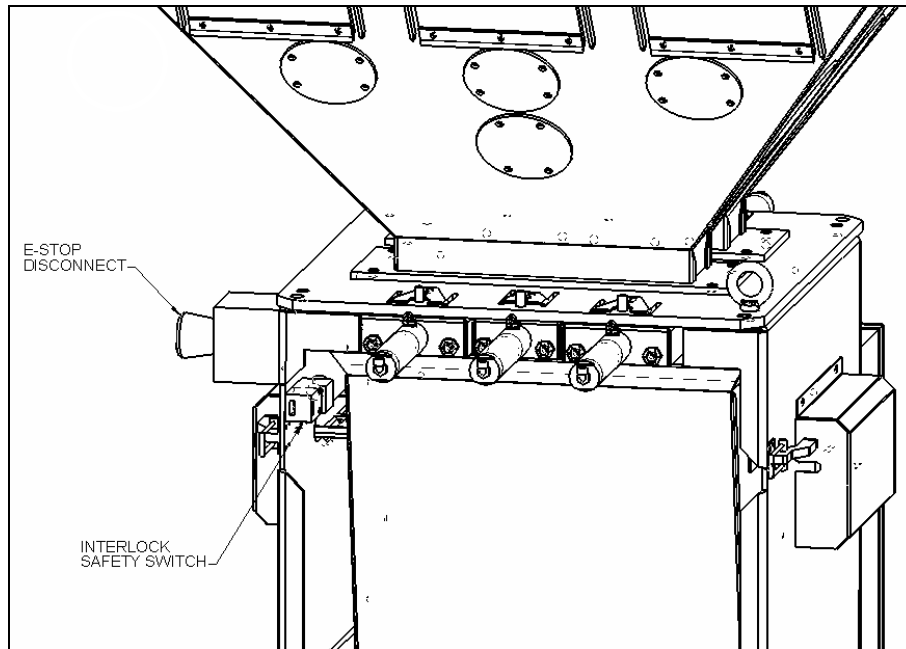
WARNING! *Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning the Slide Gate/Auger Blender. Failure to do so may result in serious injury. No one but the person who installed the lockout may remove it.*

Chapter 3: Installation

3-1 Uncrating the Equipment

Slide Gate/Auger Blenders are shipped mounted on a skid, enclosed in a plastic wrapper, and contained in a crate.

1. Remove crate from around blender.

2. Secure strap of proper lifting capacity to both lifting lugs (See Figure 20 below.).

Caution!   *Use approved safety straps or chains to lift the blender at the marked lifting points.*

3. Lift blender until strap is taut.

4. Remove bolts attaching bottom of blender to shipping skid.

5. Lower blender slowly.

Figure 20: Blender Lifting Lugs (1 on each side)
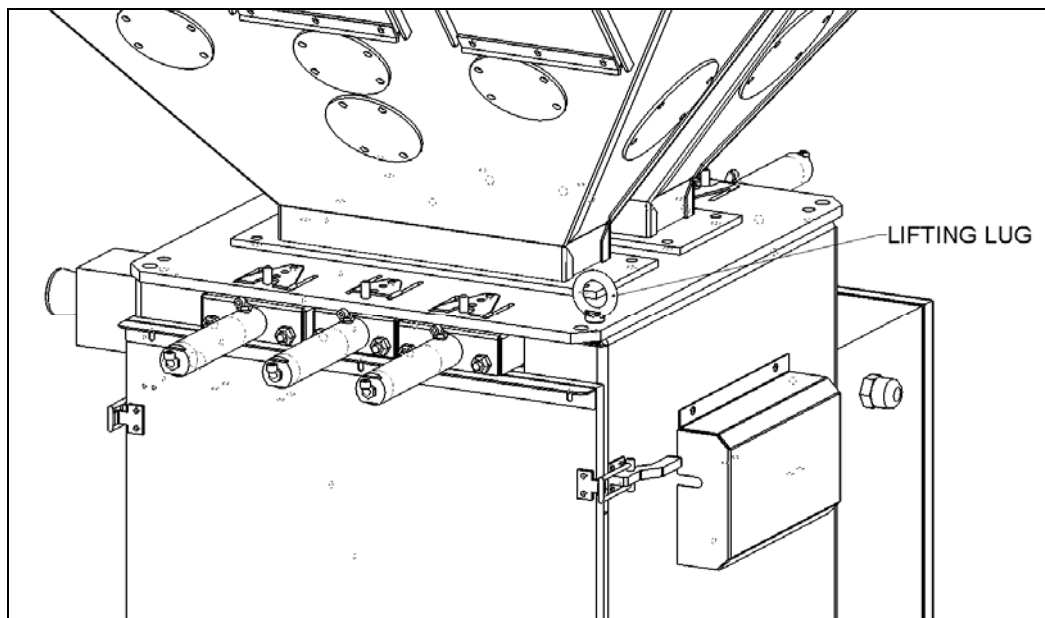
3-2 Mechanical Installation

It is the intent of this section to familiarize the reader with the proper site requirements and installation procedures of the Slide Gate/Auger blending system. The information in this section is NOT meant to replace or supersede an established local or company implemented procedures. It is meant to enhance them.

The installation procedure should be used as a general guideline for the proper installation steps required to install the Slide Gate/Auger blending system.

1. Lift blender and position over machine throat or floor stand.

2. Set in position and secure by tightening four bolts.

3. Remove lifting strap.

4. If equipped; adjust the four leveling bolts on the floor stand blender support rails.

5. Mount the material conveying system receivers on the top of the blender supply hoppers.

6. Align the weigh hopper on the load cell brackets. Carefully adjust the load cell brackets to ensure that the weigh hopper is centered on the brackets without rocking. If for some reason the locating tabs do not align with the weigh hopper, they can easily be loosened and adjusted.

   Note: **Use extreme care when tightening bolts on top of the load cells so you do not spring the load cells. The load cells are extremely delicate and should be treated with care!**

7. Check the slide gate metering assemblies to ensure they are not damaged, and will slide back and forth freely. These are the most important items on the blender, besides the load cell and weigh hopper assemblies.

Site Requirements

This section describes site requirements in detail. These requirements are broken down into mechanical mounting, electrical connections and pneumatic connections. Since the Slide Gate Blender is available in several different mounting arrangements, it is necessary for the reader to become familiar with the different arrangements.

Mounting Configurations

The Slide Gate System is available in (3) three basic mounting arrangements. They are:

- Machine Mount

- Mezzanine Mount

- Floor Mount

Machine Mount

In a machine mounting application of the Slide Gate unit, there are a few items to review *before* placement and mounting of the blending system begins.

First, verify the machine flange dimensions match the Slide Gate blender flange (if the optional pre-drilled holes were ordered). The Slide Gate blender can also be equipped with an optional cast throat section with a drain port. This will bolt under the bottom plate of the blender.

Verify that the machine throat is physically capable of supporting the Slide Gate blending system with a full load of material and vacuum loading equipment installed.

   Note: **While in operation, the Slide Gate blender applies horizontal and vertical pressures to the mounting flange. If there is a question as to the mechanical stability of a mounting flange, contact the manufacturer's engineering department.**

Verify all clearances on the top and beside the processing machine. This is to insure that all motors, hoppers, control panels, etc. have adequate room for proper operation and servicing.

Refer to the assembly drawing with the unit for actual height and width dimensions.

   Note: **Allow at least 36" clearance around blender to provide adequate room for cleaning, servicing, etc.**

Using proper lifting equipment, lift the blender, using the lifting lugs attached to the top plate of the blender. These lifting lugs can also be used to fasten horizontal or angled braces to the blender if more stability is needed.

> **Note:** **Larger blenders need to be braced as part of the installation.**

Take care to insure proper orientation with adequate access to operator controls, mix chamber, and metering units.

> **Note:** **Never weld on the blender, support stand, machine or mezzanine without first removing the control panel and verifying that the blender is properly grounded.**

Mezzanine Mount

In a mezzanine mount application, review the following items before installation begins. First, verify the Slide Gate/Auger mounting locations match the mezzanine supports. Verify that the mezzanine is capable of supporting the blender with a full load of material and vacuum loading equipment installed.

> **Note:** **While in operation, the Slide Gate/Auger blender applies horizontal and vertical pressures to the mounting flange. If there is a question as to the mechanical stability of a mounting flange, contact the manufacturer's mechanical engineering department.**

Ensure that the gravity feed tube is installed in a vertical position, so that the materials will gravity flow to the extruder hopper. Use aluminum tubing or smooth wall flex hose.

Figure 21: Typical Mezzanine Mounted Batch Blender

GRAVIMETRIC BATCH BLENDER

MEZZANINE (SUPPLIED BY CUSTOMER)

EXTRUSION CONTROL UNIT WITH RE-LOAD VALVE (PURCHASED SEPARATELY)
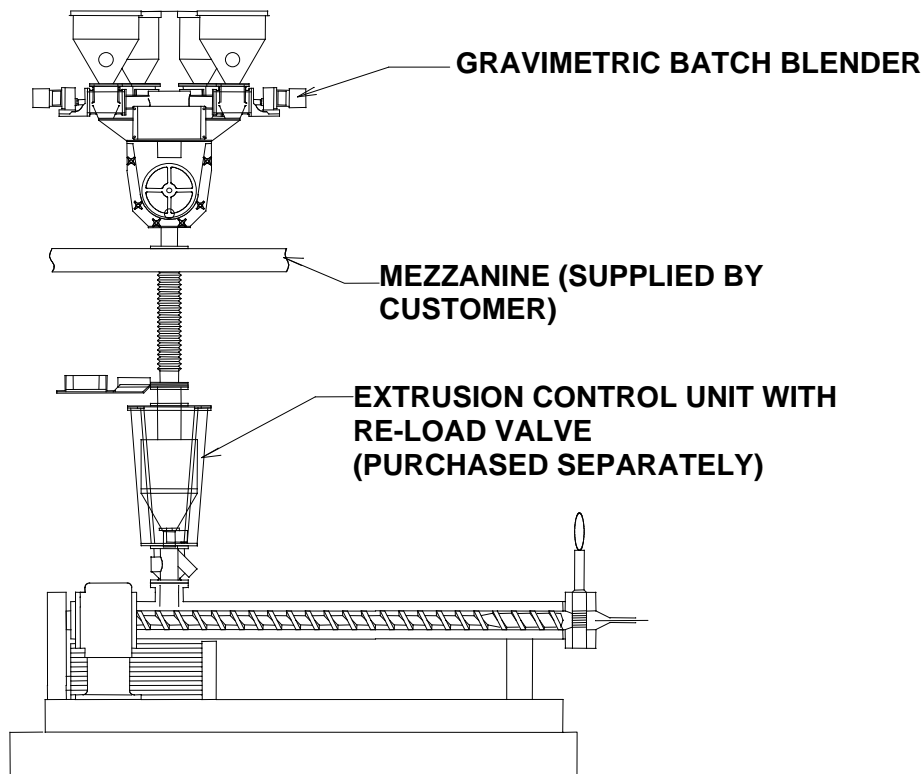
If possible, use rigid tubing. Some flex hose will tend to sag and generate static that could cause de-mixing between the blender and the extruder.

Make sure that adequate space is around the blender (36" recommended) to allow proper cleaning, servicing, etc.

Floor Mount (Central Blender)

In a floor mounting application, ensure adequate clearance for all blender operations and maintenance. The operator and maintenance personnel must have access to parts of the blender. If necessary, it is the customer's responsibility to provide adequate, safe work platforms around the blender to meet state and local safety codes. Using proper lifting equipment, lift the Slide Gate blender in place.

> **Note:** **The blender must be securely fastened to the floor before operating.**

> **Note:** **Manufacturer assumes no responsibility for any damages resulting from improper installation or improper handling during installation.**

Make sure that the blender is **securely mounted to the floor** before installing loading equipment, loading with material and starting.

Make sure that the blender location is adequately away from high traffic aisles, and that fork trucks, etc. cannot damage the blender. Ensure that normal day-to-day operations will not place the blending system at risk of damage.

Figure 22: Typical Floor Mount (Central) Blender Layout
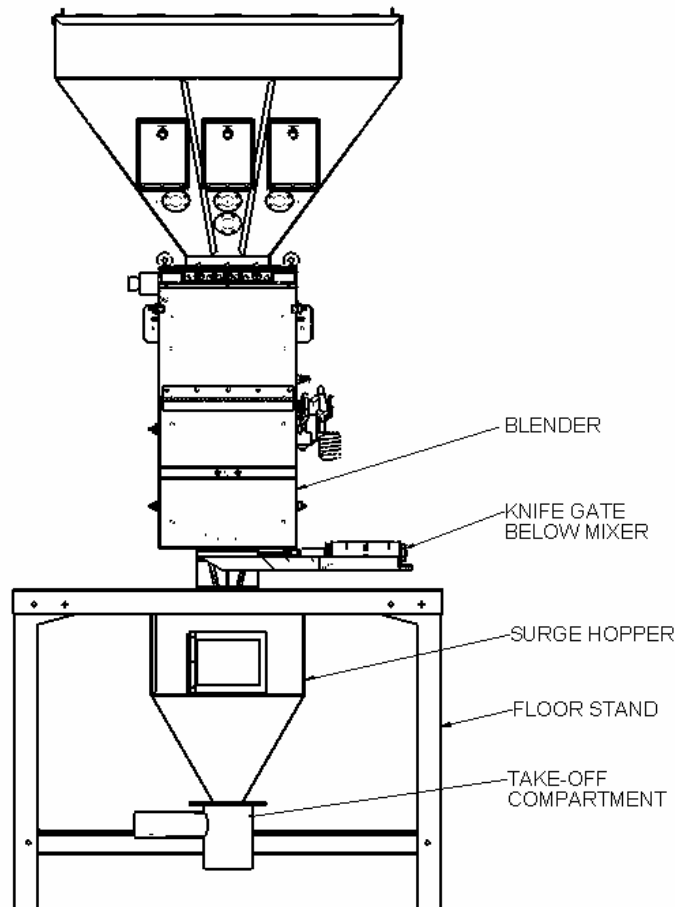
3-3 Electrical Connections

The standard Slide Gate/Auger blending system is designed to operate on 120/1/60 supply voltage (220/1/50 CE models are also available). The current requirements vary with the blender's size and throughput rating. For exact current requirements, check the blender serial number tag, located on the rear plate of the mixer section.

If a step down transformer was provided, it should never be used to power anything other than the blender. Loading equipment, etc. must be powered by another power source. As well as possibly overloading the transformer, the additional equipment may induce power line noise that may affect the operation of the blending system.

The transformer will be mounted and wired by the customer or your installer. If company or local codes require fusing or disconnects, these items must be supplied, wired, and mounted by the customer.

> **Note:** **Each blending system MUST be connected to a separate source of power. Do not connect other electrical equipment, especially self-contained hopper loaders, on the same line as the blending system.**

Ensure that the power entrance location on the blender panel remains unchanged. Make sure that the proper size wire and proper wire routing techniques are used when installing the supply wiring to the control panel. Care must be taken to ensure that the supply wiring does not interfere with the low voltage DC wiring.

The blender is equipped with a plug that functions as the disconnect device (See Figure 11 on Page 27 for an example). The mating receptacle must be installed no higher than 5' feet (1.6 m) above the floor. Make sure your installation conforms to your regional electrical standards.

3-4 Pneumatic Connections

The Slide Gate/Auger blending system uses plant-supplied compressed air to operate the metering and dump valves on the blender.

CLEAN AND DRY air must be supplied to the blender. The air supply should be filtered through a 5 micron air filter with a water separator. Oil should <u>not</u> be used unless air dryers are installed on the compressed air supply. In this situation, an oiler may be required on the blender to keep the air cylinder seals lubricated.

> **Note:** **As this blender uses air for blender metering functions, it is very important to supply clean, dry air to the blender. Dirty or oily air can affect blender accuracy; result in poor performance, and cause injury. Provide a 5-micron air filter on the air supply to the blender, and be sure excess oil is removed. Also, use a dedicated line to ensure proper air supply.**

Figure 23: Customer-Supplied Pneumatic Components
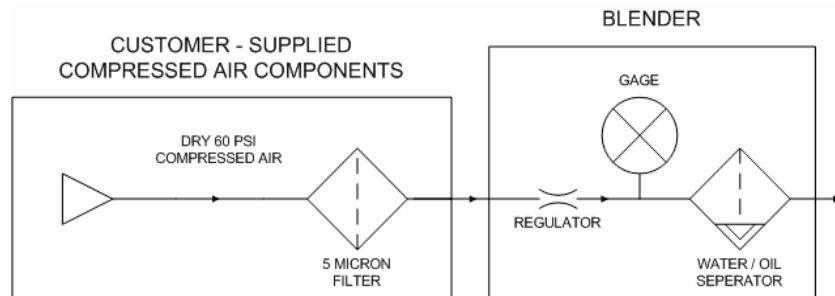
The manufacturer provides all pneumatic lines on the blender piped to a single ¼" NPT standard pipe thread fitting. The Slide Gate/Auger blending system requires approximately 1 cfm (1.7 m³/hr) @ 60 psi (4.14 bar) maximum air pressure for proper operation.

The working pressure of the blender cylinders is not to exceed 60 psi (4.14 bar). This is adjustable by the regulator supplied on the rear panel of the blender. It is important to prevent fluctuation in the air pressure to the blender by not installing the unit on an airline. If this is the case, an accumulator tank with a check valve may have to be provided by the customer to ensure the blender a steady air supply.

Caution! *To prevent damage to the equipment, do not exceed 60 psi (4.14 bar) air pressure.*

Caution! *Always disconnect the compressed air supply when working on any part of the blender.*

3-5 Initial Set-up

This section will discuss the mechanical setup and control system setup of the Slide Gate blending system. After reading this section, you should be familiar with the mechanical setup and the electronic control setup of the blending system.

Mechanical Set-up

Stroke Limiters for Metering Gates

Stroke limiters are supplied on components 1 through 6 with all Slide Gate blenders to allow standard metering gates to meter small amounts of low percentage additive materials.

Generally, the stroke limiter is not required on major ingredients (usually number 1 and 3) and should be adjusted to the rear-most position. If they are used on components number 1 and 3 the throughput of the blender will be reduced.

To install the stroke limiter, drop it into the double slot on top of the gate assembly and secure it in place with the button head screw that is provided.   Be sure to use the lock washer to prevent the stroke limiter from coming loose.

Figure 24: Stroke Limiters
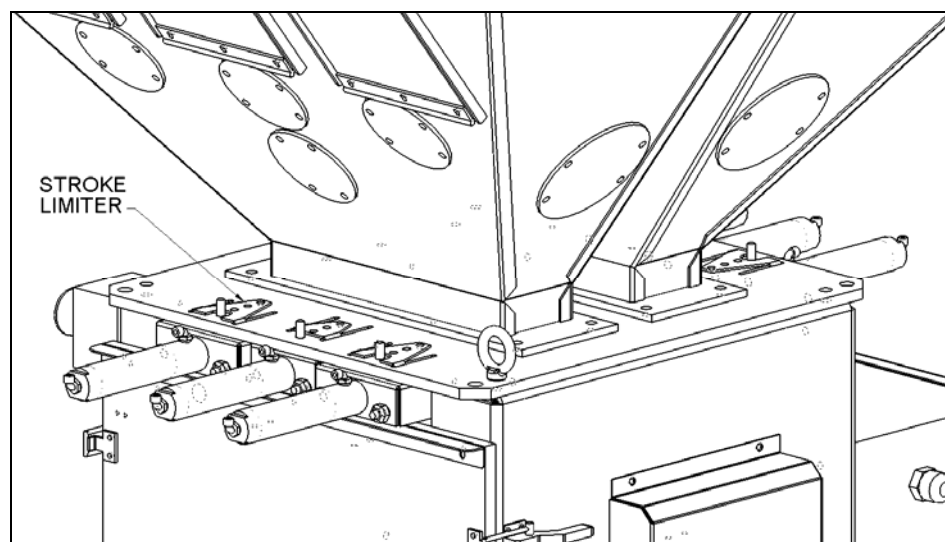
Weigh Hopper Installation

Remove the weigh hopper from the shipping box and install it in the blender on the load cell brackets. Connect the airline and close the mixer door, securing the latch.

Figure 25: Weigh Hopper

THIS SIDE
FACES FRONT
OF BLENDER
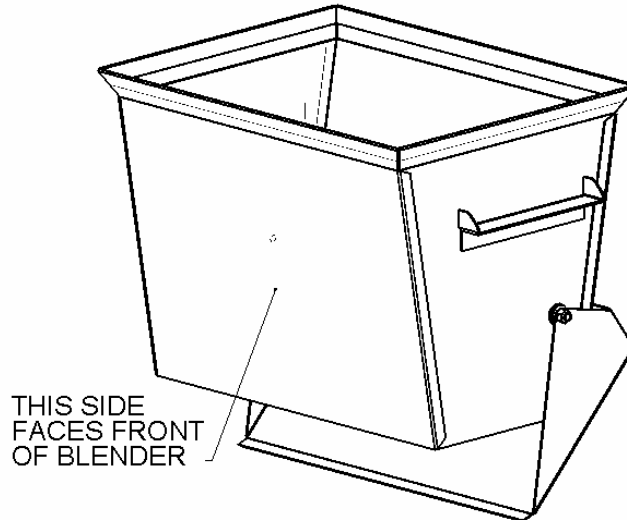
> **Note:** **THE WEIGH HOPPER ASSEMBLY MUST HANG FREELY AND BE FREE FROM FRICTION, WITH NO MECHANICAL OBSTRUCTIONS OTHER THAN THE LOAD CELL ITSELF.**

Final Connections

Connect the blender to the appropriate power source.

Connect the compressed air piping, ensuring that a 5-micron air filter is installed, along with the proper water trap, and lubrication unit, if required. Verify that 60 psi (4.14 bar) of clean, dry compressed air is supplied to the blender.

> **Note:** **Again, make sure that proper air supply connections are made to the blender, as dirty, contaminated, wet air can damage blender components eand can quickly cause poor performance and accuracy!**

> **Note:** **Make sure that the blender is supplied with clean, dry, 60 psi (4.14 bar) compressed air.**

After powering up the blender the following screen will be shown:

Figure 26: Display Startup Screen

version: Main 1.4

PLC Version   Copyright
    ####.#   2001
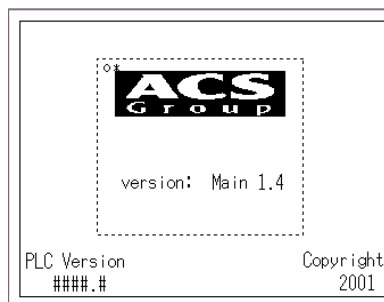
> **Note:** **It may take 45-50 seconds for the screen to appear.**

This screen displays the software version of both the PLC and the PanelView. The Controller will stay on this screen for about 10 seconds or you can touch the picture of the blender to quickly skip to the Recipe Screen (Next Screen in sequence). The software versions are also available on the Panel View Configuration Screen.

Figure 27: Display Main (Recipe) Screen
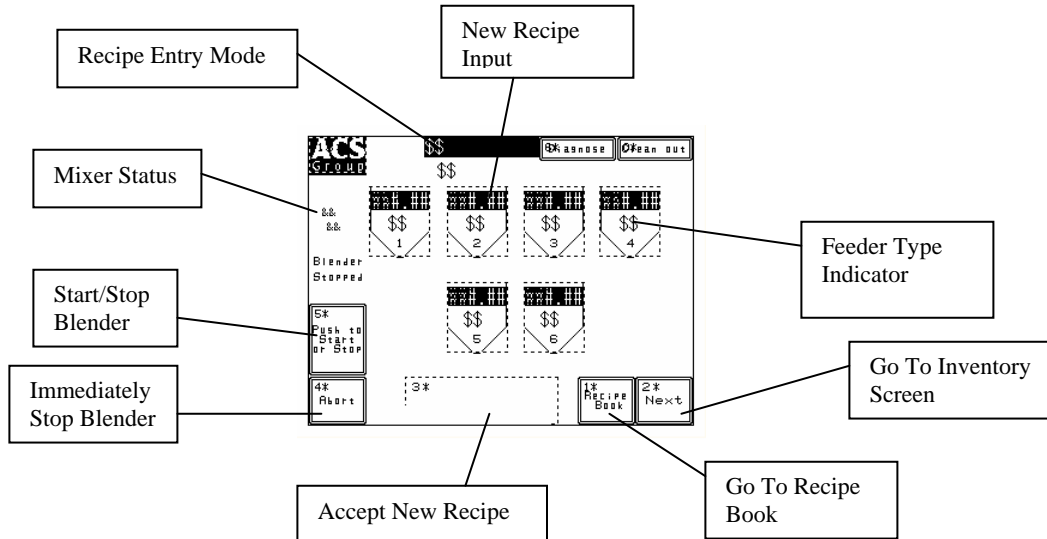
If not, the blender can be reconfigured for Quick Set, Percent, or Parts by entering the Setup menu and pressing the Recipe Format key. Then select the mode following the key prompt on the screen.

To access the Setup Menu to change the Recipe Mode and other controller features, refer to the following pages of this manual.

Controller Set-up

This section describes the proper setup of the Slide Gate blending system control parameters. These parameters are operator changeable; however, these items should only require setup during the initial installation. Only authorized personnel should change them. For security reasons, the menu that is used to access these parameters is password protected.

Many of the variables and setup parameters have been preset at the factory and do not need to be changed. However, this section of the manual will address all of the blender setup parameters that were available at the time of printing. The purpose of this is to familiarize the reader with all the setup parameters and their usage.

A complete listing of all default values is provided at the end of this manual.

Blender Controller Menu Structure

"Recipe" Page" (Start)
- Change Recipe Values by touching the number you wish to change
- Touch "Accept New Recipe" button after you've made the desired changes
- Start or stop the blender by touching the "Push to Start" or "Stop" button
- Access "Recipe Book" Page
- Access "Clean Out" Page
- Access "Inventory Page"
- Access "Setup" Page

"Recipe Book" Page
- Save the running recipe to the book
- Delete a stored recipe
- Load a stored recipe
- Erase all stored recipes
- Modify the product ID for a stored recipe
- Return to the "Recipe" page

"Clean Out" Page
- Empty the blender hopper(s)
- Manually Operate the mixer, weigh hopper dump gate, and the slide gate below the mixer
- View and test all inputs and outputs on the blender
- Return to the "Recipe" Page

"Inventory" Page
- View the accumulated inventories
- View batch time
- View blender's maximum capacity
- View the average process rate
- Return to the "Recipe"

"Setup" Page
- Login from the inventory page by hitting "Login" and entering in your password. Then access setup by touching the Sterling Logo.

Recipe Format
- Percentage, Parts, or Quick Set
- Batch Size
- Inventory Shutdown
- "Batch ready" mode
- "Auto start" mode

Report Setup
- Blender Number
- "Auto clear" option
- "Auto interval" setup
- Auto start time

Calibration
- Scale Calibration
- Direct Scale Readout
- Feeder Calibration

Mixer and Dump Setup
- Mixing Time
- Remix Time
- Dump Time
- Dump Delay
- Dump Cycles
- Mixer Dump Time
- Timed/Continuous Mixing Option

F940 "Config"
- View software version
- Access F940 "Config" setup to modify time settings

Units
- Blender data units (lbs. or kgs.)
- Target vs. actual data units (lbs. or kgs.)

Alarm Log
- View and clear the alarm log

Alarm Setup
- "Stop/Continue" when out of material
- "Alarm/No Alarm" when out of material
- "Alarm Silence" delay

User Interface Lock
- Lock the user interface to prevent others from making changes or viewing your blender. Be sure to logout after locking.

Blender Calibration

The load cells on the Auger blender are FACTORY CALIBRATED. Since the load cells can be subject to shock loading during shipping, moving, etc., we recommend that they be recalibrated.

The heart of the Auger blending system is the **load cell** with the supply calibration weight. They monitor the weight off each ingredient added to the blender weigh hopper. Since load cells are reading the actual material weight that is metered by the feeders, **the proper calibration of these load cells is essential for the correct operation of the blender**. This calibration must be performed upon initial installation and startup of the blender. **They should also be checked once a month with a calibration weight and if necessary recalibrated to ensure that they have not been damaged in the normal routine of removing and replacing the weigh hopper for cleaning, color changes, etc.**

The calibration of each load cell is accomplished by using two reference points on the output of the load cell scale. The first of these points is known as the "Tare Weight". This is the weight of the empty hopper assembly on the load cell. This is also known as the zero weight point (starting point) of the scale. This zero or starting point must be initialized with an empty weigh hopper. There must be no binding or leverage put on the load cell.

The second weight point used in the load cell calibration procedure is a known amount of weight for the weigh hopper. A calibration weight is provided with all Slide Gate/Auger blending systems. The calibration weight is stamped with its actual weight on top. If this is not available, any object with a known weight accurate to the nearest 1/100th of a pound, in the 2 - 10 lb. range, proportional to your size blender, will suffice. (The weight should be as close as possible to the maximum batch size you plan to run.) The weight will be in pounds, unless the blender is provided for metric operation. In the case of a metric blender display, the weight to be used is calibrated in kilograms.

Given the two weight points on the load cell scale, the controller should determine any other weight on the load cell span. This is limited to the maximum capacity of the load cell. The standard load cell used on these blenders has a span accuracy of $^1\!/_{10}$%.

The maximum capacity of each load cell is clearly marked on top of the load cell. This value will be indicated in kilograms (1 kg = 2.2 lbs.).

> Note: It is not necessary to calibrate the weight scale on a brand new blender, although it is recommended that the calibration be checked periodically to ensure that the reported inventory totals are accurate. Remember that in most cases a bad calibration is worse than no calibration.

Weigh Hopper (Load Cell) Calibration

(Recommended only if the calibration is out of spec)

1. From the "Recipe" Page, touch the Manufacturer's icon and enter "5413", then press the "Enter˝ key.

2. Touch "Calibration" and then "Scale Calibration".

Figure 28: Display Calibration Menu Screen
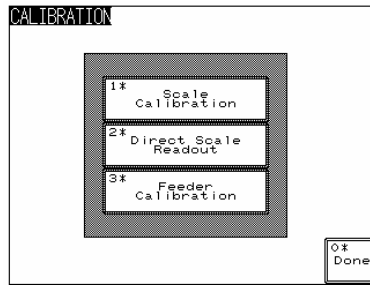
3. Once in "Scale Calibration", enter in the scale calibration weight value stamped on the side of the weight.

4. The controller will prompt you to remove the weight hopper and press OK.

5. After touching OK, the controller will display "PLEASE WAIT..."

6. Next, the controller will ask you to hang the calibration weight on the right loadcell bracket (loadcell A) and press OK.

7. The controller will ask you to hang the calibration weight on the left loadcell bracket (loadcell B) and press OK.

8. Finally, the controller will ask you to replace the weigh hopper in the blender and press OK to complete the calibration.

9. The controller will verify that the calibration was done correctly by showing "Calibration Successful."

10. Press "Done" until you have reached the Recipe screen.

Figure 29: Display Calibration Screen
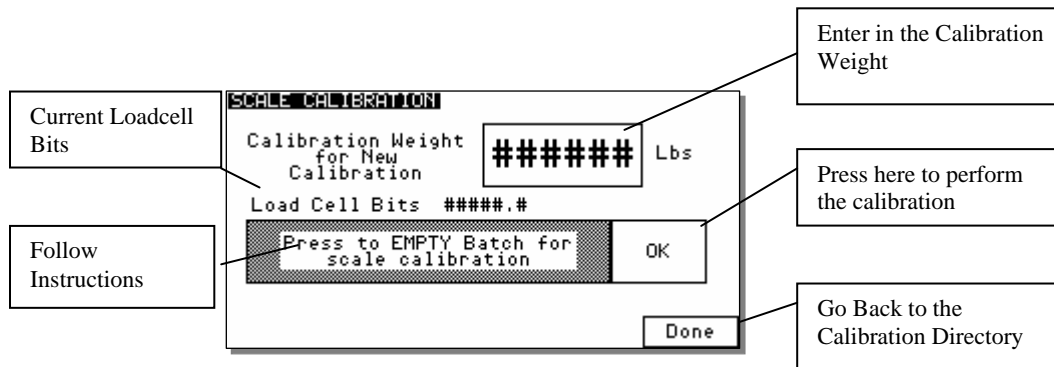
Verifying Calibration (Recommended on a periodic basis to ensure accuracy)

1. From the "Recipe" Page, touch the Manufacturer's icon and enter "5413", then press the "Enter" key.

2. Touch "Calibration" and then "Direct Scale Readout".

3. Remove the weigh hopper.

4. Locate the weight display for each of the two load cells directly below "Current Bits." Write down the displayed value.

5. Add the calibration weight to each load cell mounting bracket and write down the value displayed in "weight", as in step 4.

6. Subtract the values recorded in step 4 from step 5. This is the measured weight. If the measured weight is within a 0.003 pounds of the weight stamped on the calibration weight, then you are within spec. If not, follow the steps above to calibrate the blender. (If your blender is frequently out of calibration, verify the operator is being cautious removing the weigh hopper during clean out.)

7. Press "Done" until you have reached the Recipe screen.

8. ***Anything in the Diagnostics Menu that is not covered here is in the Detailed Controller Setup Section***

Feeder Calibration (Auger Blenders)

Feeder calibration should be done on all Auger blenders prior to start-up. This allows the blender to configure the parameters which will best suit the auger size and gearbox ratio of the feeder. To perform a feeder calibration, the operator must enter the "**Feeder Calibration**" screen (see menu structure), select a feeder number, then touch "**Press Here**." The feeder calibration will start automatically and will notify the operator when complete. If the operator so desires, they can repeat the process by entering in a new feeder number and touching the "**Press Here"**button.

If the blender does not see enough weight gain during the calibration process or if the weigh hopper reaches maximum weight, then an error is given and the calibration is a failure. Another useful feature on the **"Feeder Calibration"** screen is the ability to manually enter in the "weight per second" values. This increases the blender learning process and the values can be recorded for future blending.

Alarm Setup

This screen allows the operator to configure the alarm settings for each individual feeder. It can configure whether a feeder will retry during the metering of a batch, and enable or disable the "Out of Material" alarm for any feeder. If the alarm flag is set to "Stop", the blender will not continue. It stops on that component continuing to try and meter. The optional low level proximity switches have their own separate alarm. The alarm will sound, but does not stop the blender. To configure each hopper do the following:

1. Enter the Setup Menu.

2. Once in the Setup menu, press "Alarm Setup." This will take you to the "Alarm Flags & Feeder Setup" screen.

Figure 30: Display Alarm Flags & Feeder Setup Screen
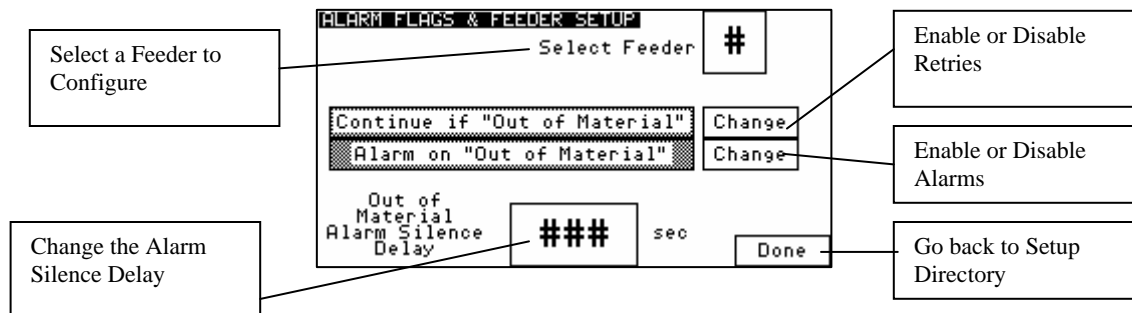
3. Select a feeder (1-6) by touching the "Select Feeder" box.

4. The current settings for the hopper that you have chosen will now be shown on the screen.

5. Make the necessary adjustments to the "Stop/Continue if "Out of Material," Alarm/No Alarm on "Out of Material," and Out of Material Alarm Silence Delay (0-60 seconds) settings." Once the settings for these features have been set on the displayed feeder, select a new feeder to configure as desired.

6. Press the "Done" key at the bottom to exit this screen.

Network Setup

The blenders baud rate is the speed at which data is transferred to and from the blender's communication port. The blender IP is the address of this blender on a network. The Slide Gate blender is factory set up at 192 baud, with an IP address of 01.

In order to change the values, enter the Setup menu, press the "Network Setup" button and change the values accordingly. Baud rates available are 120, 240, 480, 960, 192. Blender ID's can range from 1 through 255.

Figure 31: Ethernet Setup Screen

Enable or Disable the Ethernet Module Configurator

Go back to Setup Directory

Setting Date and Time

The Set Date & Time feature is located in the "Panel View Config" menu of the Setup Screen. This feature allows the operator to set the Slide Gate/Auger Blender's internal time clock and date. The clock data must be entered in the traditional Hours, Minutes, and seconds. The date must be entered in Years, Months, and Days. All values in this screen can be entered by pressing on the related button and choosing the correct number.

Figure 32: PanelView Configuration Screen

Go back to Setup Directory

Press to set Date & Time
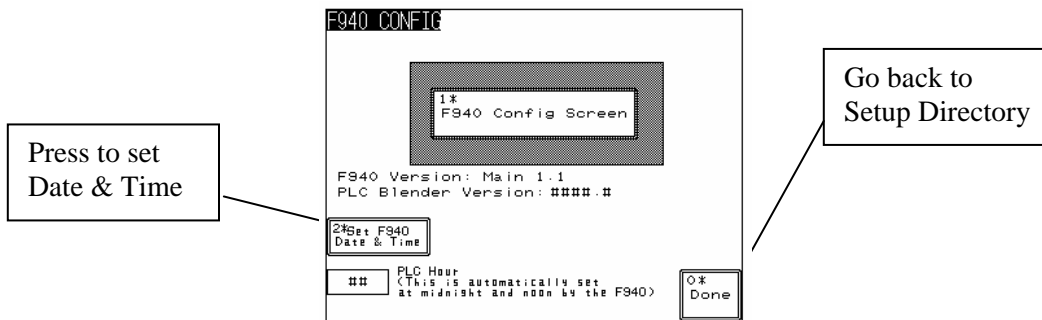
Additional Setup Parameters

The settings listed below are set at the factory and typically do not require any change.

1. From the "Recipe" Page, touch the Manufacturer's icon and enter "5413", then press the "Enter" key.

   Note: **If the controller is set to Continuous Mixing, then the blender will run continuously while the blender is operating. If it is set to "Timed Mixing" then the mixer will run for the "Mixing Time" setting when a batch is dumped into the mixer.**

2. Touch the "Mixer and Dump Setup" key to enter the amount of time the mixer will mix or the batch is dumped.

3. Enter a "Mixing Time" by pressing the number next to "sec", this is the amount of time to run the mixer after a batch is dumped into the mixing chamber. Remember that if the mix time is too long you may get material separation.

4. Press the number next to "sec" on the "Remix Time" to set "Re-mix" off time. This allows the mixer to come on between batches if the blender cycle time is very slow, i.e. if you want the mixer to come on every minute, set this to 60 seconds. If you don't want to use this function, set the time to "0".

5. Press the number next to "sec" on the "Dump Time" to set your dump time (A value between "1" and "999" will need to be entered.). This feature is the amount of time required to empty the batch hopper. (Set the time so that all the material in the weigh hopper has a chance to be evacuated.)

6. Press the number next to "sec" on the "Dump Delay" line for the optional dump delay setting. This is the amount of time to start the mixer prior to dumping material into the mixing chamber. Set to "0" to disable this feature.

7. Press the number next to "Dump Cycles" to enter the number of times that material will be dumped from the weigh hopper. This allows the dump valve to open and shut repeatedly when the weigh hopper is empty to shake lose any sticking material. If this feature is set to "1" then the batch will dump normally.

8. Press the number next to "sec" on the "Mixer Dump Time" to enter the amount of time that the mixer will run while dumping material out of the knife gate below the mixer. This feature assists in cleaning out the mixer.

9. Press "Done" to return to the "Setup" screen.

10. Press "Alarm Setup" on the "Setup" screen to look at the "Alarm Flags & Feeder Setup screen."

11. This screen allows you to change the way alarms on each feeder function. Enter the feeder you wish to configure by pressing the corresponding feeder number under "Select Feeder". You can select "Stop if "Out of Material" which means if there is any kind of alarm on this feeder, the blender process will stop (i.e. The feeder supply hopper is out of material.) You can also set it to "Continue if "Out of Material." This mode will alarm but let the blender continue to operate or you can set it to "No Alarm on Out of Material" mode. "No Alarm" mode does not set off any alarms. In addition, an "Out of Material Alarm Silence Delay" specifies the amount of time before an alarm will be set off.

12. Press "Done" to return to the "Setup" screen.

3-6 Initial Startup

The operator can startup the blender by selecting the button that says, "Push to Start or Stop" (startup) on the left side of the Recipe Screen, depending on whether the blender is currently running or is stopped. Simply touch the button to either start or stop the blender. If the operator selects "Stop Blender" then the current batch in progress is first finished and then the blender will stop making new batches.

To immediately stop the blender, the operator can touch "Abort Current Batch." This will cause the blender to stop making the current batch immediately. Obviously, if the blender is stopped in this method then the current batch will not be completed properly.

Chapter 4: Operation

4-1   Start-up

General Operation

The general operation of the Slide Gate/Auger blending system is as follows: Once the system is properly installed and set up, the system will be ready for operation. Please see the Installation and Setup chapter in this manual for further information.

Once the Slide Gate/Auger blending system is powered on, the unit will display the recipe screen (the recipe format should be in "Quickset" recipe mode). Pressing the highlighted box next to the feeder number, the operator can enter a valid recipe or use a previously stored recipe from the recipe book.

1. The blender is started by turning system on or material dropping below level switch in mix chamber.

2. Metering gates are opened (or auger motors are turned on) to meter material into the weigh hopper in the programmed order.

3. Each component is weighed, then the batch is dumped into the mix chamber (provided the mixer "High level" switch is not covered).

4. The material is mixed in the mix chamber and flows into the processing machine.

5. The optional slide gate below the mixer may control the flow of material to the molding machine or extruder.

Quick Start Procedure

New Recipes

1. Calibrate the weigh hopper before running the blender (This will improve inventory accuracy.). See page 45 for calibration instructions.

2. Ensure that all ingredient supply hoppers to be used are filled with material. Virgin material should be loaded into hopper #1 and regrind into hopper #3.

   Note: Hopper #3 on some models is equipped with an oversized square gate to assist in the feeding of the regrind material.

3. Enter the recipe menu on the touch screen by turning on the pendant controller (It will automatically default to this screen), and enter the blend recipe desired following the steps listed below:

   a. Touch the box (labeled 1-6) that shows the hopper you want to change.

   b. Touch the "Touch Here to CHANGE" button.

   c. Enter in the new value (0 to 999.99) and hit the enter button (arrow).

   d. Touch "Done".

   e. After you have entered the new values for all hoppers (1-6), then push the "Accept New Recipe" button and the recipe will be entered.

Note: **The blender monitors the operator's entries and determines if the recipe is valid before accepting the new recipe. If there is an error (such as the recipe does not add up to 100% and the blender is in Percentage Mode.) then a message is shown on the Recipe screen to alert the operator of the problem. The "Accept New Recipe" button is only shown if the recipe is valid and different from what is currently running on the blender.**

Note: **Recipes can also be changed while the blender is running. The new accepted recipe is entered at the beginning of the next batch. This allows the operator to modify the new recipe without affecting the blender until they hit the "Accept New Recipe" button.**

Existing Recipes

The operator can load a previously stored recipe from the Recipe Book. The Recipe book also allows the operators to save the current running recipe. This can be done by performing the following steps:

1. Touch the Recipe Book icon located on the Recipe Screen.

2. Select a stored recipe by changing the number next to "Recipe #"

3. Touch "Load" and then "Done" (This will take you back to the Recipe Screen.).

4. Touch "Accept New Recipe" to accept the loaded recipe into the blender.

To save a running recipe to the Recipe Book:

1. Go to the Recipe Book by touching the Recipe Book icon located on the Recipe Page.

2. Select a stored recipe by changing the number next to "Recipe #".

3. Touch "Save Running Recipe" and then "Done"

Note: **Press "Push to Start or Stop" button to start blender.**

4-2 Operation Procedures

The objective of this section is to familiarize the reader with the Slide Gate blender recipe menus, run mode operation, run mode menus and displays. Upon the completion of this section, the reader will be familiar with the recipes and run mode displays that are available on one blender, including the recipe book and recipe storage facilities. Other items covered in this section are optional printer functions and report generation capabilities of the Slide Gate/Auger blending system.

Topics covered in this section are:

- General Operation

- Recipe Menu

- Optional Printer Menu

All personnel operating the Slide Gate/Auger blending system should read this section of the manual *before* operating the blending system.

Operator Displays

The Slide Gate/Auger blending system utilizes a standardized menu format. Each screen was designed to be user-friendly and provide the operator with the necessary information to run the blender.

Figure 33: Typical Recipe Entry Operator Screen
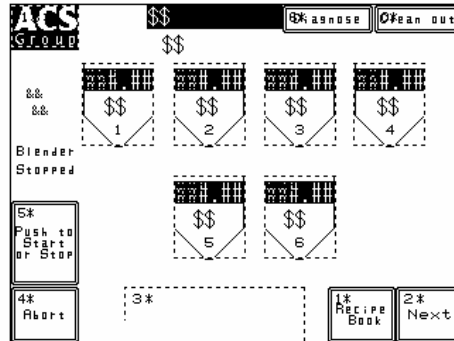
A typical menu is shown in the figure above. This display, which is defaulted to when the controller is turned on, provides the operator with the following information and options:

- The ability to change Recipe Values

- Accept a newly entered Recipe

- Start or Stop the blender

- Access to the Recipe Book

- Access to the Clean-out Screen

- Access to the Inventory Screen

- Access to the Controller Setup Screen

The menu tree shows the structure for a standard Slide Gate/Auger blender.

When the unit is initially installed the Manual Control menu will be used. This screen is primarily used for trouble shooting the blender. All outputs can be controlled manually and all digital inputs from the proximity switches can be viewed. Pressing the "Manual Control" key when in the "Setup" menu accesses this screen. To gain access to the "Setup" menu, a password will be requested.

Figure 34: Typical Manual Control Operator Screen
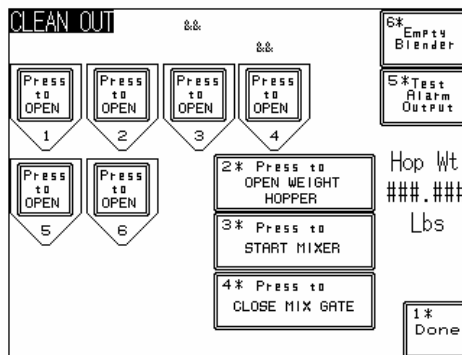
While the blending system is in operation, there are a couple of displays available to the operator. These displays are selected simply by pressing the "NEXT" key when the unit is running. The default display shown when the blender is in run mode is the Recipe Screen.

The Recipe Screen indicates by feeder number, the amount of material metered into the weigh hopper assembly by that particular feeder. This display is updated after each component dispenses its specified amount. The ingredient weights (Unit Values) are in pounds, unless the metric display is selected.

Pressing the "NEXT" key when in the default recipe mode display will toggle to the next screen, which is the Inventory Display. *This can be done at any time, but if the blender is in a critical mode such as dumping, and updating inventory, etc., it may ignore the keystroke. Simply press the "NEXT" key again, the Inventory screen will be displayed.*

Figure 35: Typical Inventory Display Operator Screen
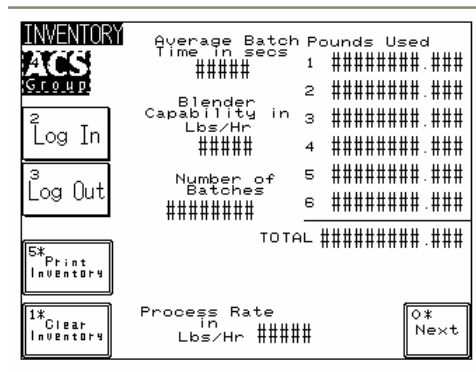
This display indicates the amount of material in pounds that has been used by each feeder of the recipe. It is important to note that the weights are rounded off to the closest pound. On minor ingredients, several cycles may have to occur to show an inventory number.

In addition to showing the amount of material that has been used for each feeder, this screen is also a summary display that shows the total inventory, the time for the last batch, and the average rate of the blender.

If the blender is run in "Percentage Mode" instead of "Quickset" Mode during operation, the "Percentage Mode" will use the blender inventory numbers shown on the Inventory screen to calculate the percentages for each ingredient. It is important to zero the inventories when a recipe is changed to have this screen accurately reflect the current percentages of the recipe in-process.

> **Note:** **Blender inventories must be cleared when the current recipe is started to show accurate percentages for the current recipe.**

> **Note:** **To clear inventories, press the "Clear Inventory" key on the "Inventory" print screen.**

Recipe Entry Formats

The Slide Gate/Auger System contains several operator friendly recipe menus. This section of the manual lists these recipe menus:

- Recipe Page (Start/Setup)
- Recipe Book Page
- Recipe Format

Upon Start Up, the blender controller will default to the "Recipe Menu" screen.

The "Recipe Book" screen can be accessed in the "Recipe Page" and is useful in storing and retrieving recipes.

The Recipe format option can be accessed in the Setup screen and is used to select one of three available formats: "Quickset" Mode, Percentage Mode or Parts Mode. ("Quickset" mode is the default setting preset at the factory.) In addition, every feeder in the blending system does not need to have values entered (Percentage or Parts recipe formats), or a material type (REGRIND, NATURAL, or ADDITIVE) in "Quickset" Mode recipe format.

Recipe Format Menu:

- "Quickset" Recipe, Percentage or Parts

- Metering Order

- Batch Size

- Inventory Shutdown

- "Batch ready" mode

- "Auto start" mode

- Weigh every batch options

The Recipe Format screen allows the user to change many parameters concerning the way that the recipe is entered by the operator. It is accessed by touching the manufacturer's icon on either the Recipe screen or the Inventory Screen. The user must enter in the User Password to gain access (see User Password Setup for details.).   The following Recipe Modes are described on the next few pages.

"Quickset" Mode (Most common in injection molding)

The "Quickset" menu structure allows recipes to be entered and adjusted by touching the buttons on the panel face (for 1 to 6 components). In this mode, hopper #1 is configured as virgin, hopper #3 is configured as regrind, and the others are configured as additives, i.e. color. The operator enters in the percentage of regrind and additives, and the virgin percentage is automatically calculated. The regrind percentage represents a percentage of the total batch, and the additives are based on a percentage of the virgin weight. This is useful because the percentage of regrind can be changed without affecting the ratio of color or additive to the virgin weight. Each percentage can be up to 100%, but not greater. The virgin percentage is automatically calculated by the blender and the operator is not required to enter it.

The ingredient names selected will be displayed on the run mode display so the operator will know what material is being blended.

> **Note:** **The #1 hopper ("NAT" - Virgin Material) recipe ingredient will not be shown on the recipe setup menu.**

> **Note:** **ADD (Additive) designations will weigh the ingredient as a percentage of natural material only.**

> **Note:** **RGD (Regrind) designations will weigh the ingredient as a percentage of the total batch. (It is assumed the regrind has been generated from pre-blended production and already contains the same color and/or additives.)**

> **Note:** **Virgin material must be loaded into hopper #1 and regrind into hopper #3.**

> **Note:** **Component #3 is designed to handle regrind and most models come equipped with a larger, square gate to reduce the likelihood of bridging. If regrind is being used, it should always be run through component #3. If you don't have regrind, another major ingredient can be run through component #3.**

Figure 36: Example Calculations of a 5-component blend in "Quickset" mode

Virgin (NAT):	???
Additive1 (ADD):	5.00% - of virgin component
Regrind (RGD):	30.00% - of total batch
Additive2 (ADD):	2.00% - of virgin component
Additive3 (ADD):	1.00% - of virgin component

Batch Size:	10.00 lbs.
Total available:	100.00%
Regrind:	30.00%
Balance:	70.00%

Virgin + Additive 1 + Additive 2 + Additive 3 = 70.00%

Virgin + (5% of virgin) + (2% of virgin) + (1% of virgin) = 70.00%

Virgin + (5/100 x virgin) + (2/100 x virgin) + (1/100 x virgin) = 70/100

100 virgin + 5 virgin + 2 virgin + 1 virgin = 70

108 virgin = 70

Virgin = 70/108 = 64.81%

Virgin = 64.81% of batch

Additive1 = 5% of 64.81% = 3.24% of batch (5% of virgin)

Regrind = 30% of batch

Additive2 = 2% of 64.81% = 1.30% of batch (2% of virgin)

Additive3 = 1% of 64.81% = 0.65% of batch (1% of virgin)

Virgin + Additive 1 + Additive 2 + Additive 3 + Regrind = 100%
64.81% + 3.24% + 1.30% + 0.65% + 30.00% = 100%

"Percentage" Mode (Most common in extrusion and blow molding)

Extrusion processing often requires recipes in percentage format, especially if regrind is not involved, i.e. blown or cast film.

In this mode, operators enter in values for each hopper up to 100%. The total of all the hoppers must equal 100%. If they don't, an error message appears on the Recipe screen and prevents the recipe from being accepted. All hoppers are a percentage of the total batch size.

> **Note:** **All ingredients are weighed as a percentage of the total batch.**

"Parts" Mode (Often used in Compounding Applications)

The "Parts" recipe entry mode lets the operator enter in values based on a parts ratio rather than a percentage. Each entry can be up to 999.99 and the total of all hoppers does not have to be 100. After all values are entered, the total parts are calculated. The individual hopper target is then calculated based on each hopper's entered parts. These parts represent ratios of the total batch. For instance: Hop 1=300 parts, Hop 2=100 parts, Hop 3=10 parts, Hop 4=5 parts. This would mean that if the batch was divided into 415 parts, then Hop 1 would make up 300 of those parts, Hop 2 would make up 100, Hop 3 10 parts, and Hop 4 5 parts.

> **Note:** **The preset part will be divided by the total of all parts, with each part representing the calculated weight for ratio control.**

Figure 37: Example Calculations of a 4-component blend in "Parts" mode

Feeder Tag		Preset Part	Calculated Weight (Ratio Control)
Virgin	#1	7,200	7,200/10,000
Regrind	#2	2,000	2,000/10,000
Color	#3	500	500/10,000
Additive	#4	300	300/10,000
Total:		10,000	

Current Recipe Menu

Throughout the menu structure, the top left corner of the display will list the name of the current screen that you are in. Each individual button will indicate instructions for keystrokes. In the Recipe Format menu shown on the previous page, pressing on the mode button displayed at the top of the screen will show the Current Recipe menu.

> **Note:** **The blender will always run the percentages shown in the Current Recipe menu display.**

Switching Modes

Recipe Modes can be switched while the blender is making a batch. At any time the operator can switch the recipe entry mode without affecting the current batch being made. The recipe mode is part of the "New Recipe" and is separate from the running recipe.

Recipe Setup
Batch Size

The Slide Gate/Auger blending system is a gravimetric batching system. The blender will weigh a preprogrammed batch of material each cycle. This batch size is determined by the blender's weigh hopper size, the current recipe, and the bulk density of the ingredients.

Because the blending systems must handle a wide variety of materials, with varying bulk densities, the actual amount of weight of material the weigh hopper will hold can vary dramatically from application to application.

This feature allows the operator to change the size of the batch to be made. A value will need to be entered between 0.5 to 99.9. This can also be changed while making a batch without affecting the current running batch. If the size is changed then you will need to touch "Accept New Recipe" on the Recipe screen before the change takes place. This feature allows stored recipes with different batch sizes to easily be loaded without the operator having to reconfigure the blender every time they want to load a stored recipe.

The weigh hopper size selected should be one that approaches the maximum capacity of the load cells without over-filling the weigh hopper. During the initial setup of each blender, the weigh hopper size setting should be checked to ensure that the weigh hopper is not overfilling due to a large percentage of light weight regrind, etc. The batch size will vary from model to model. The bulk density of the material being blended will also affect the batch size.

> Note: **If running a high percentage of lighter density regrind, set the batch size so that the mixer does not overfill, preventing the weigh hopper from fully dumping when operating in "Batch Ready Mode".**

Figure 38: Typical Batch Sizes

Blender	Batch Size (lbs.)
150	1.5
500	4.0
900	8.0
2500	25.0
4000	35.0
6000	45.0

Inventory Shutdown

In many applications, the user of the Slide Gate/Auger System produces large runs of blended material on the same recipe during production. An example may be a 40,000-lb. run of a certain specification plastic extrusion. Others may wish to fill a 1,000-lb. gaylord box in a central blending application. In either case, the manufacturer has provided a means to automatically stop the blending system when the blended material has reached a preset total blended weight. This is known as Inventory Shutdown.

When the Inventory Shutdown value is reached, the blender will finish the current batch of material. It will then stop and display to the operator that the inventory value has been reached. Additionally, it will flash an alarm and wait for operator attention. An example of this screen is shown below:

Figure 39: Typical Blender Shutdown User Prompt Operator Screen

Touch to make another box of material

The blender has reached the inventory shutdown amount and has been stopped.

Restart Blender

Stop Blender

Touch if you don't want to make another batch
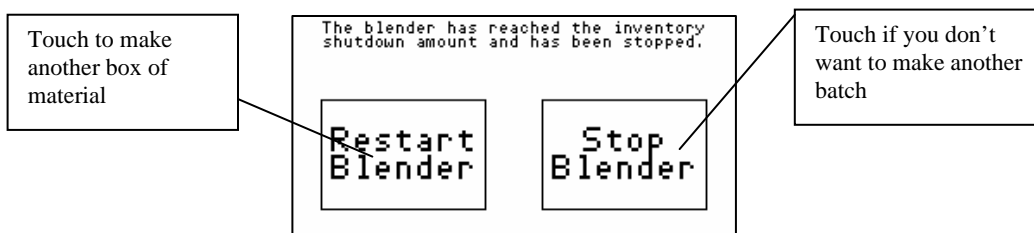
To enable this feature, simply enter a desired shutdown weight value (from 1 to 999999999) into the Inventory Shutdown display line of the Recipe Format screen, under the Setup menu.

This feature can be configured while the blender is making a batch. If the Inventory Shutdown is changed, then you will need to touch "Accept New Recipe" on the Recipe screen before the change can take place. This allows stored recipes with different Inventory Shutdown settings to easily be loaded without the operator having to reconfigure the blender every time they want to load a stored recipe.

To disable this feature, simply enter a zero (0) value.

Batch Ready Mode

This enables the blender to have a batch already made in the weigh hopper while the mixer is full. Enabling this feature dramatically increases the maximum achievable blender rate.

Auto Start Feature

By enabling this feature, the blender accurately finishes a batch that was interrupted by loss of blender power. This option starts the blender if it was running prior to power loss. It does not turn on the blender if it was previously stopped prior to power loss.

Mixer and Dump Setup

Mixer Options

Press the "Timed/Continuous Mixing" key (In the top right hand corner) when in "Mixer and Dump Setup" screen to set the following options:

Timed Mixing Option

This mode of operation turns the mixer on only during dumping and during the re-mix time set into the control to jog the mixer during high level mixer operation.

Continuous Mixing Option

This mode of operation turns the mixer on after initial startup and will continue to run continuously, unless the remix time is set to jog the mixer during high level mixer operation. This option is used for sticky materials that tend to bridge and block off the mixer discharge to the processing machine.

Mix Timer

The mix timer is the amount of time that the mix motor will mix the material after it has entered the mixing section of the Slide Gate/Auger blender. The timer has a range of 1 to 999 seconds.

To set the value of the mix timer, the user must gain access to the Setup Menu. After entering the Setup menu, the user must select "Mixer and Dump Setup."

Figure 40: Typical Mixer and Dump Setup Operator Screen
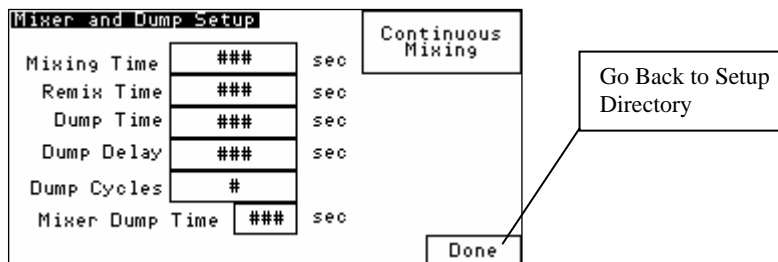
Selecting "Mixing Time" from the "Mixer and Dump Setup" menu will allow the operator to view the current time setting for the mix timer and to adjust it as needed.

The mix timer is set to a default time of four (4) seconds. This time can be adjusted up or down depending on the amount of mixing needed for the materials being blended.

It is recommended that the mix time be held to the minimum, as segregation can occur from over-mixing if the material bulk density and pellet configuration varies with materials in the particular blend being processed.

Re-Mix Timer

In some applications, the Slide Gate/Auger blender will require the use of the re-mix timer. Some materials tend to separate if they are mixed too long. This is possible when a processing machine is running at a rate significantly below the capacity of the blender.

With external vibration, the heavier pellets will tend to flow to the bottom of the mix chamber before the lighter material. This will occur even though the mixer is in a static mode. By re-mixing occasionally, this situation will be prevented.

The re-mix timer will start another mixing cycle if the blender has been idling long enough for the re-mix timer to time out. The re-mix timer may be set on the "Mixer and Dump Setup" screen from 1 to 999 seconds. Setting the re-mix timer to zero will disable this function.

If the re-mix timer is disabled, the controller will run only a single, timed mix cycle after each dump of the weigh hopper.

To view and change the value of the re-mix timer, refer to the "Mixer and Dump Setup" menu. All current values for Mixing and Remixing Times will be shown on this screen. The re-mix timer default value is factory preset at zero.

Weigh Hopper Dump Time

The weigh hopper dump time is the amount of time the weigh hopper's dump valve remains open to allow weighed material to exit the hopper and enter the mixer.

To view and change the current weigh hopper dump time settings, enter the Setup menu and select the "Mixer and Dump Setup" screen. Press the field next to "Dump Time" to set the operation of the Dump Valve.

The dump timer on the dump valve has a default time of four (4) seconds. This time can be adjusted to optimize the blender cycle time.

The timer should be set to close the dump valve shortly after the material has totally dumped from the weigh hopper. This time can vary due to material flow characteristics, and the size of the batch that is programmed into the blender control. Experimentation with this setting can allow the operator to determine the best cycle for the material being weighed.

Weigh Hopper Dump Delay Time

The dump delay time is the amount of time from the end of metering the last ingredient until the start of the actual dump cycle. The start of the dump cycle is marked by the opening of the weigh hopper dump valve. This value has a range from 1 second to 999 seconds. To view and change the current dump delay time, enter the Setup Menu, select "Mixer and Dump Setup" screen, and then select "Dump Delay".

The default time is factory set at zero seconds. This delay time is used to start the mixer prior to dumping the material from the weigh hopper into the mix chamber of the blender.

Weigh Hopper Dump Cycle

The dump cycle allows the weigh hopper dump valve to cycle, or open and close, a number of times prior to commencing with the next batch cycle. The setting allows from 1 to 9 dump cycles between batches (open and closed cycles).

The normal and default factory setting is 1, meaning the weigh hopper dump valve will open at the end of the weighed batch and close after the batch is discharged into the mixer.

Setting the dump cycle to more than one cycle may be useful when blending high static, dusty material or those that have sticky tendencies. This will cycle the dump valve open and closed to allow any material that may cling to the dump valve.

To enter the dump cycle menu, first enter the Setup menu by pressing the Manufacturer's icon from the main menu. Enter the password and press enter. Next, press the button marked "Mixer and Dump Setup". The display will show the "Mixer and Dump Setup" menu. Press the "Dump Cycle" key to enter a dump cycle value and press enter. Please refer to the menu structure tree shown in section 3-5.

Mixer Dump Time

The mixer dump time is the amount of time the knife gate below mixer's valve remains open to allow blended material to exit the blender.

To view and change the current mixer dump time settings, enter the Setup menu and select the "Mixer and Dump Setup" screen. Press the field next to "Mixer Dump Time" to set the operation of the Dump Valve.

The dump timer on the dump valve has a default time of six (6) seconds. This time can be adjusted to optimize the blender cycle time.

The timer should be set to close the dump valve shortly after clearing the high-level sensor. This time can vary due to material flow characteristics, and the size of the batch that is programmed into the blender control. Experimentation with this setting can allow the operator to determine the best cycle for the material being mixed.

Alarm Flags

An alarm message will be shown if any alarm condition occurs. A message will pop up on the screen until the alarm condition is resolved. The operator can press "OK" on this pop-up to hide the screen temporarily, but if the alarm condition is still unresolved, then the message will reappear after a short delay. During an alarm condition, not only will a visual alarm show up on the screen but also an audible alarm will sound. The audible alarm will sound for 10 seconds and reappear every 30 seconds until the cause of the alarm is resolved. The following is a list of all alarm names and descriptions:

Hopper 1-6 Out of Material: This alarm indicates that a hopper is out of material and signals the operator that they should check the resin system.

Figure 41: Typical "Out of Material" Alarm Screen

```
        HOPPER 1
     Out of Material




            ┌─────────┐
            │   OK    │
            └─────────┘
```

Max Hopper Weight Exceeded, check batch size: This alarm indicates that the weight in the weigh hopper has exceeded the maximum allowed weight. This alarm can happen if the operator changes material density and does not perform a feeder calibration, but will usually be automatically fixed after the first batch. As long as this alarm doesn't continue to reappear, then the operator should not be concerned. If the alarm continues to occur, then the operator should have maintenance check the blender.

Figure 42: Typical "Maximum Hopper Weight" Alarm Screen

```
 MAX HOPPER WEIGHT
      EXCEEDED
 check batch size


        ┌──────┐
        │  OK  │
        └──────┘
```

Calibration Error, Clean out hopper and check calibration: This alarm indicates that the maximum empty weight for the weigh hopper has been exceeded. The blender will automatically tare up to 0.25 lbs of material, but if this weight is exceeded, then an alarm will appear. This alarm is most commonly caused by a build up of sticky material in the weigh hopper and can be corrected by simply cleaning out the weigh hopper. If this does not correct the problem, then the scale calibration should be checked by maintenance.

Figure 43: Typical "Calibration Error" Alarm Screen

```
    CALIBRATION
      ERROR

        ┌──────┐
        │  OK  │
        └──────┘
```

Power Interruption while metering a Batch: This alarm indicates that the blender's power was turned off while the blender was making a batch. The batch accuracy is not affected as long as the blender is configured for "AutoStart." The blender will finish the last batch accurately even if the material was dumped into the mixer when the power was turned off.

Figure 44: Typical "Power Interruption" Alarm Screen

```
 POWER INTERRUPTION
  While metering a
       Batch


        ┌──────┐
        │  OK  │
        └──────┘
```

PLC Battery Low: PLC battery is low and may cause the blender to lose both the program and the blender configuration. Notify Maintenance immediately.

Figure 45: Typical "PLC Battery Low" Alarm Screen

```
┌─────────────────────────┐
│   PLC BATTERY LOW       │
│                         │
│                         │
│              ┌──────┐   │
│              │  OK  │   │
│              └──────┘   │
└─────────────────────────┘
```
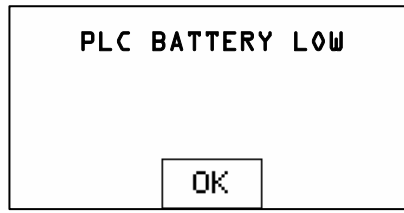
Blender Powered On/Off: These are only logged in the Alarm Log and does not cause a pop-up message or audible alarm. Each time the blender is powered on or off, the time and day is logged to the Alarm Log.

Inventory Cleared: This is only logged in the Alarm Log and does not cause a pop-up message or audible alarm. Each time the inventory is cleared, the time and date are logged to the Alarm Log. An alarm will sound and a screen will pop up when Auto. Inventory Shutdown has been reached.

E-Stop Screen: The blender is equipped with an E-stop switch that removes the power from all mechanical outputs. The E-Stop Screen appears along with an audible alarm whenever the E-Stop is activated. The operator can not access any screens until E-Stop is deactivated. The Panel View will then put the screen back to the display that the operator was on prior to hitting the E-Stop.

Figure 46: Typical "E-Stop Activated" Alarm Screen

```
┌──────────────────────┐
│   E-STOP HAS         │
│      BEEN            │
│   ACTIVATED          │
└──────────────────────┘
```

Feeder Clean Out

Any feeder in the Slide Gate/Auger blending system can be emptied and refilled with a different material. To do a feeder clean out, the operator has to press the "Clean Out" icon key from the recipe screen (the first screen that appears on power up).

This screen will allow you to Open or Close the Feeder, Weigh Hopper, Mixer Knife Gate, Empty the Entire Blender, Start or Stop the Mixer Motor, Test the Alarm Output, Find out the Mixer Proximity Status and monitor the Current Hopper Weight.

Figure 47: Typical Manual Control Operator Screen
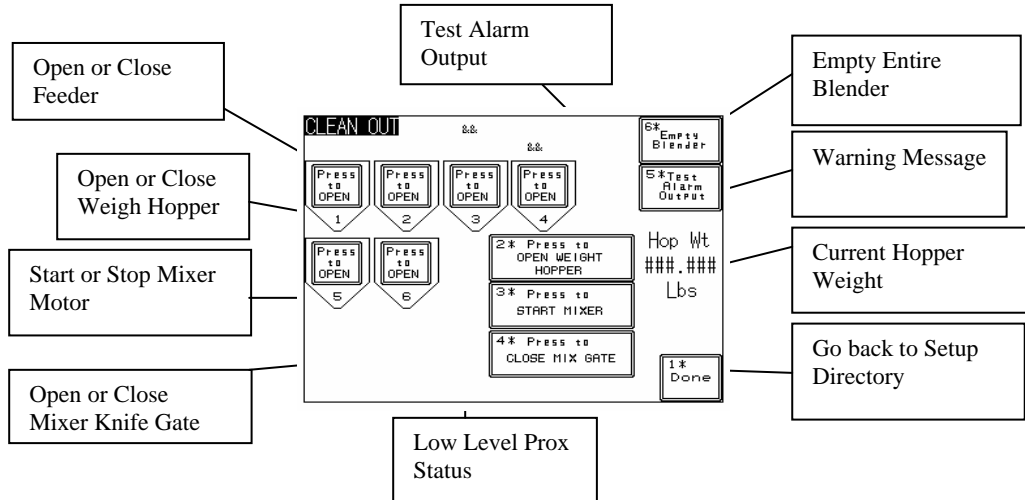
The dump valve opens as soon as the "Press to Open Feeder" key is pressed. This easy feeder clean out option also serves as a means for emptying a batch that is held in the weigh hopper if the "Press to Open Weigh Hopper" key is pressed when the blender is stopped. To open/close feeder numbers 2, 3, 4, 5 & 6 press the number next to "Press to Open Feeder" to select the feeder you desire to empty and the "Press to Close Feeder" key to close the dump valve. Touch the "Done" key to return to the recipe menu. After entering a recipe, the operator will restart the blending system, putting it back in normal operation.

> **Note:** **Before starting Slide Gate/Auger blending systems, each ingredient hopper in the current recipe must contain material! Virgin material must be loaded in hopper #1 and hopper #3 should only be used for regrind!!**

Once the operator initiates the run mode of operation, the blending system controller will begin monitoring the mixer high-level switch. Nothing will happen until the mixer high-level switch is uncovered. This tells the controller that the mixing chamber is capable of holding another batch of material.

Once the mixer high-level switch is uncovered, and the weigh hopper has dumped, the system will meter the ingredients from the supply hoppers, through the metering units, into the weigh hopper. Each component will be metered individually to allow accurate weighing of the material.

Each component is metered in the order specified by the "Metering Order" setup. See the Installation & Setup chapter for further details.

Once the final ingredient specified in the recipe has been metered into the weigh hopper, the controller will take a final weight reading of the weigh hopper. This will start the "Dump

Delay" timer. (See Page 51). Once the dump delay timer has timed out, the controller will activate the weigh hopper dump valve, initiating the weigh hopper dump cycle.

The open weigh hopper dump door will allow the material to drop into the mixer section of the blender. If the dump delay is set, the mixer will start before the weigh hopper dump will open for the selected time.

The blender will sit at rest until the high-level sensor in the mixing chamber is uncovered to start another weigh cycle. (Unless the Re-Mix timer is set to a value other than 0 and times out to restart the mixer to run for another mix cycle.)

The level sensor is located on the back wall of the mixer chamber. If the sensor is covered with material, the indicator light on the back of the sensor will be lit.

Once this sensor is uncovered, the indicator lamp on the back of the level sensor will go out. This level sensor must be uncovered for approximately 1 - 2 seconds to indicate to the controller that there is room in the mixing section to accept a batch of material.

When the controller has determined that the mixer is ready for an additional batch of material, the controller will begin metering material into the weigh hopper assembly.

Recipe Book

In many applications, it is favorable to hold several recipes in the memory of the blending system. The Slide Gate/Auger blender has provided for this by incorporating the manufacturer's recipe book software.

The recipe book is capable of holding 50 different recipes. These may be stored and recalled by number. *During this section of the manual, the operator may wish to revert to the Menu Tree Diagram in section 3-5 of this manual.*

It is important to note that the recipe book only stores and recalls recipes. **The blender will operate on the current recipe only**, so a recipe must be recalled from the book to the current recipe for it to be active.

Each recipe stored in the recipe book may be displayed and/or modified. Only the current recipe will be blended.

Always verify that the Current Recipe is showing what you want to run, and that the correct recipe has been downloaded from the book.

The recipe book section contains the following Items:

- Save Running Recipe to the Book
- Load a Stored Recipe from the Book
- Display a Stored Recipe
- Erase One Recipe or the Entire Recipe Book

Figure 48: Typical Recipe Book Operator Screen
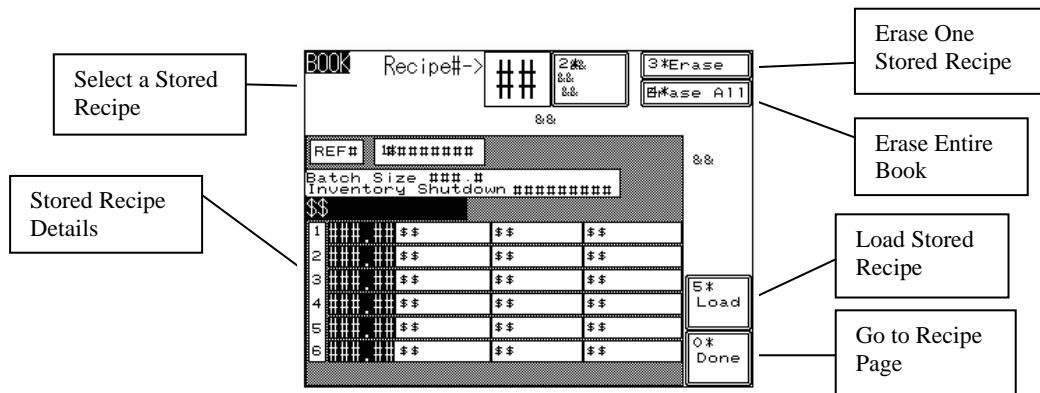
Save Running Recipe to the Book

The save current recipe to book function allows the operator to save the contents of the current recipe to the recipe book under a desired number.

Upon selecting this function, the operator will be prompted for a reference recipe number. This may be any number from 1 to 50.

The assigned recipe number will be used for all further references to this recipe until deleted. The operator should be familiar with the recipe numbers used. We suggest keeping a loose-leaf notebook with 50 tabbed pages as a reference to what is kept in the blender so this can be the standard for all blenders in the plant, etc. To save a running recipe to the Recipe Book perform the following steps:

1. Enter the Recipe Book by touching the Recipe Book icon located on the Recipe Screen.
2. Select a stored recipe by changing the number next to "Recipe #."
3. Touch "Save Running Recipe" and then "Done".

Load a Saved Recipe from the Book

The load from book function allows the operator to retrieve a previously stored recipe from the recipe book and install it into the current recipe menu. This will overwrite the current recipe, so make sure that it has been saved to the book before installing a new recipe in its place. To load a previously stored recipe from the Recipe Book:

1. Enter the Recipe Book by touching the Recipe Book icon located on the Recipe Screen.
2. Select a stored recipe by changing the number next to "Recipe #."
3. Touch "Load" and then "Done" (this takes you back to the Recipe Screen).
4. Touch "Accept New Recipe" to accept the loaded recipe into the blender.

    Note: If replacing the current recipe with one that is downloaded from the Recipe Book, make sure that the previous recipe has been saved, as it will be overwritten by the new downloaded recipe.

Display Recipe Contents

The display recipe function is used to verify the contents of a recipe number before it is loaded from the recipe book. In order to view the desired recipe, the operator must enter the

number which contains the recipe he wishes to view. Once a valid recipe number is entered, the display will indicate the contents of the stored recipe in percentages.

Erase Recipe or Entire Book

The Erase Recipe or Entire Book function is used to eliminate old or outdated recipes from the recipe book. If the operator only wants to delete one recipe, the configuration for that recipe should be currently displayed on the screen. The controller will only prompt the operator if they want to erase the entire book when that key is pressed. Once a recipe number is deleted, the contents of that recipe are lost. The recipe number may be used again in the future for new recipes.

Color Changes

The color change procedure is meant for use with the basic Slide Gate/Auger Blender. This procedure assumes that the color component of the blend is in an additive ingredient hopper (#2, #4, #5, or #6).

> **Note:** **The blender must be stopped to make color changes. The processing machine can operate on virgin material only during this procedure with an optional quick color change bypass tube that can be installed to bypass the blender. Contact the factory for details.**

1. Disable and clean any color loading equipment. Please refer to the loading equipment manual for any clean up recommendations.

2. Using the blender "Abort" or "Push to Start or Stop" key put the blender in stop mode. After the cycle has completed, switch "OFF" the main power switch and unplug the blender power supply.

3. Open the upper mixer access door. This shuts off air to the blender circuit by deactivating the master air valve. Then unplug the quick disconnect from the air supply hose to the blender to further ensure that no air pressure is supplied to the blender.

WARNING!   *Always unplug the main power cord.*

WARNING!   *Always disconnect the air supply to the blender.*

WARNING!   *Prior to performing any operations inside any access areas of the blender where there are moving parts.*

6. Remove the weigh hopper by unplugging the air line disconnect fitting, holding the dump door closed, lifting the hopper to clear the load cell brackets, and gently pulling the weigh hopper out of the blender.

WARNING!   *To reduce the chance for damage to delicate load cells, use care when lifting the weigh hopper off load cell locating tabs and when reinstalling the weigh hopper on load cell brackets.*

7. If you want to catch the color, use a small plastic pail or chute to collect the material from the slide gate assembly. Reach up inside the blender to the color slide gate and push it open. At this point, there should be no air pressure on the blender, and the slide gate should move easily. Drain the color out in the bucket. Blend and Reclaim normally provides a JIT (Just in time) approach to the minor ingredients, so that a minimum amount of material is held in the blender so that color changes can be made easily.

8. If any other ingredients need to be changed for the next recipe, simply drain the larger hoppers with the drain tubes provided on the side of the hoppers. When the material level is below the drain tube, open the slide gate manually to dump the rest of the material. If you wish to speed the emptying process, material can be manually drained out of the slide gate assembly into a dump chute or bucket, while draining from the drain tube.

9. Using a vacuum cleaner or air hose, clean out all the hoppers that have been emptied. Always start at the uppermost part of the blender and work downward to prevent dust and pellets from falling into an already cleaned area.

WARNING!   ***The auger metering assemblies on Auger blenders can be removed after the hoppers above them have been drained.***

10. Clean the weigh hopper and mixer assemblies on the blender using a vacuum cleaner. The mixer agitator is removable for cleaning if desired.

11. Reinstall any metering units that were removed from the blender during clean out.

12. Reinstall the weigh hopper using care to center the hopper on the load cells on the weigh hopper bracket.

13. Load the blender with new material.

14. Restart the unit with the new recipe.

WARNING!   ***Always disconnect and lockout all electrical power and pneumatic (i.e. compressed air) sources prior to servicing or cleaning any product, including all Slide Gate/Auger blending systems. Failure to do so may result in serious injury or death.***

4-3   Shut-down

The Slide Gate Gravimetric Blender can be stopped in one of two ways:

1. To immediately stop the blender, the operator can touch "Abort Current Batch." This will cause the blender to stop making the current batch immediately. Obviously, if the blender is stopped in this method then the current batch will not be completed properly.

2. If the operator desires to complete the current batch of material, then he can wait until the Inventory Shutdown value is reached. The blender will finish the current batch of material to the specifications set in the Setup portion of this manual. It will then stop and display to the operator that the inventory value has been reached. Additionally, it will flash an alarm and wait for operator attention. An example of this screen is shown below:

Figure 49: Typical Inventory Shutdown Operator Screen
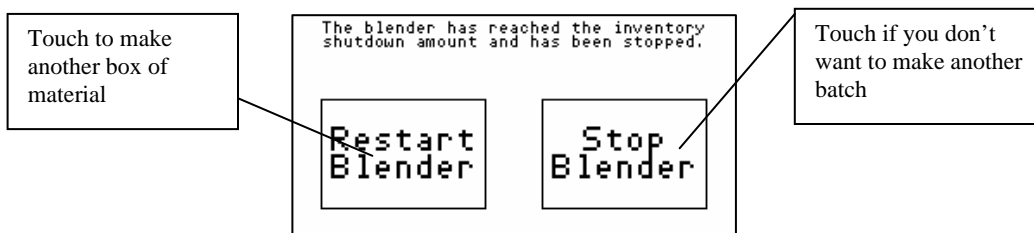
Chapter 5: Maintenance

5-1   Preventative Maintenance Schedule

The mechanical design of the blender is very simple and very little maintenance is required. The only moving parts are the metering gates, weigh hopper dump valve, and mixer agitator. The checklist below contains a list of items which should be inspected and/or replaced to keep your blender operating at peak efficiency. Perform each inspection at the regular intervals listed below.

Figure 50: Sample Preventative Maintenance Schedule

System model #						Serial #						
Daily	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By
Inspect blender for any loose parts- tighten them immediately.												
Verify quality of compressed air supply.												
Verify mixer door is properly latched.												

Every week	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By	Date/ By
Inspect metering gates for proper operation.													
Check to make sure that all hose connections are air tight.													

Every month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Inspect air regulator and air safety circuits, if equipped.												
Recalibrate blender only If necessary.												

Photocopy this page for your maintenance records

5-2   Preventative Maintenance

Our blenders need periodic maintenance to provide long dependable service. Check these elements regularly:

- Check functionality of safety circuit daily.

- Maintain proper air pressure and drain water from trap assembly on regulator – as required.

- Periodically lubricate slide gate rails.

WARNING!   *Always remove plug and disconnect power before servicing blender.*

WARNING!   *Always read operating manual before operating or servicing blender.*

5-3   Corrective Maintenance

Electrical

This section is designed to give the operator an overview of the electrical system that controls the Slide Gate/Auger blending system. Since the blender's control panel is a self-contained pluggable item, seldom will a maintenance person be required to enter the control panel. For purposes of understanding the system, it is advisable that the maintenance personnel be familiar with not only the internal workings of the control panel, but also with the input and output signals to the Slide Gate/Auger blender.

This section includes the following:

- Internal components of the control panel

- Input signal to the control panel

- Output signals from the control panel

Internal Components of the Control Panel

> **Note:**   **See Installation Packet supplied with unit for complete electrical schematics.**

This section describes the internal components of the Slide Gate/Auger blending system control panel. It is not the intent of this section to completely familiarize the reader with the details on industrial control panel construction or standards, but simply to familiarize the reader with the major components inside the control panel.

The customer must supply 120/1/50 or 60 (or 220/1/50 or 60) via wires L1 & L2 (N). Please insure that the earth ground connection is properly connected to an established earth ground.

- "Power on" is indicated by a lighted on/off switch.

- "Slide gate below mixer" switch controls position of **optional** slide gate.

- "Safety Active" light displays status of safety interlock circuit. Audible alarm horn alerts operator to blender fault.

Input Signals to Programmable Controller

The Slide Gate/Auger blending system has two main input signals that it uses from the blending process: the mix hopper high level signal and the weigh hopper load cells. This, of course, does not include the operator touchscreen input.

The mix hopper high level signal is generated by a proximity level sensor located in the right hand portion of the mixer chamber (viewing from the mixer door).

Load cells require +10 volts DC to operate. This is known as the load cell's excitation voltage.

Output Signals from Programmable Controller

The Slide Gate/Auger blending system uses several output control signals to control the process. All of these are very similar in nature, the first of which is the mixer motor control.

The mixer motor is controlled by a PLC output.

The weigh hopper dump valve output functions similar to the mix motor output. Please refer back to the wiring diagram. The origin of the weigh hopper dump signal is a PLC output.

The auger motor outputs are driven from a control output from the PLC.

Each blending system includes an auxiliary customer alarm output. This dry contact can be used to switch a remote alarm signal.

The customer alarm output is provided to actuate or energize a variety of alarm horns, buzzers, strobe lights, and beacons. **These are normally provided by the customer, and care will have to be exercised not to exceed the maximum current draw (3 amp maximum).** The contacts will close whenever the control detects a fault that will somehow inhibit the blending system from properly blending the material.

> Note: **The customer alarm contact is open if the panel control power is turned off.**

> Note: **This contact is for use with a customer supplied alarm device as described above.**

> Note: **The alarm contact has a maximum load of 3 amps.**

Chapter 6: Troubleshooting

6-1 Introduction

The utmost in safety precautions should be observed at all times when working on or around the machine and the electrical components. All normal trouble-shooting must be accomplished with the power off, line fuses removed, and with the machine tagged as out of service.

The use of good quality test equipment cannot be over-emphasized when troubleshooting is indicated. Use a good ammeter that can measure at least twice the AC and DC current that can be encountered for the machine. Be sure that the voltmeter has at least minimum impedance of 5,000 OHMS-per-volt on AC and 20,000 OHMS-per-volt on DC scales. Popular combination meters, VOM and VTVM can be selected to provide the necessary functions.

Before making haphazard substitutions and repairs when defective electrical components are malfunctioning, we recommend that you check the associated circuitry and assemblies for other defective devices. It is common to replace the obviously damaged component without actually locating the real cause of the trouble. Such hasty substitutions will only destroy the new component. Refer to wiring diagrams and schematics.

Locating mechanical problems, should they occur, is relatively straightforward. When necessary, refer to the parts catalog section.

Figure 51: Typical Troubleshooting Problems and Suggested Corrective Actions

Problem	Corrective action
Nothing happens when I push "Start Blender"	Check to make sure that air is hooked up and the regulator gauge reads at precisely 60 PSI.
	Check that the access door to the mixer is shut properly.
	Look on the Recipe Screen. If you see "Mixer Full", then check the mixer. If the mixer is not full, then check that the mixer prox is adjusted properly (small screw on back).
"E-STOP has been Activated" is shown	Check the E-Stop located on the front of the blender panel.
"Interface has been Locked" is shown	Click "Unlock" and enter in your User Password.
I've forgotten my User Password	Contact the Service Department.
POWER INTERRUPTION ALARM	Power was lost during a batch. Check your power source unless you intentionally killed the power during the batch.
PLC Battery Low	Change out the PLC with your spare and reprogram new unit. Send old PLC back to manufacturer for repair.

Problem	Corrective action
	Normal after a software upgrade. Follow on-screen instructions.
PLC Module Loaded	Check the input power. Verify that 110 volts (or 220 volts) are ±10%. This voltage must remain constant with all the motors starting and stopping. Insure that the blender is on a "clean" circuit that does not have other equipment on it. If the power is known to be intermittent and have problems, set up the unit to run in "AutoStart" mode. See the factory setup sheet at the end of this manual. In this mode, if a short power interruption occurs, the blender will automatically restart.
	Check the power supply. Make sure that it has +5 VDC output to the CPU board. Adjust to +5 VDC, ±0.1 volt.
	Check the display ribbon cable connection to the CPU board and the display. See the electrical chapter for more information.
	Check the contrast adjustment located on the display board.
	Check keyboard ribbon cable connections.
	Check the CPU board for "lockup". To do so, reset the CPU board by cycling the power off and on at the motor control panel.
Weigh hopper occasionally overfills.	Check batch weight setting in the recipe menu. See the setup chapter for more information.
	Check the load cells and weigh hopper mounting for binding, etc.
	Check to see that a pellet has not lodged under a load cell.
	Check the ingredient supply hoppers to verify proper ventilation. If a vacuum receiver has a leaking flapper valve and the supply hopper is not vented, the blender computer can learn inaccurately and cause an overfill condition on the next few cycles.
	Check the load cell connections to the panel.
Material tends to separate in the mixing chamber.	Check the mix timer setting. This problem is normally due to over mixing. See the mix timer section in the setup chapter. Reduce the time until the problem is corrected.
	Check the mixer drive to ensure that the agitator is turning properly.
	Check the high level switch in the mixer to lower the level slightly.
Material sticks to the flapper of the weigh hopper and is not dumped.	Increase the Dump Cycles setting in Mixer and Dump Setup.
Too much material remains in the mixer.	Increase the Mixer Dump Time in Mixer and Dump Setup.
The material is not being mixed thoroughly.	Increase the Mixing Time in Mixer and Dump Setup. Actually if you over mix material, you can have the same problem. If you have the blender set for "Continuous Mixing" then change it to "Timed Mixing" and adjust the Mixing Time appropriately.

Problem	Corrective action
Recorded Inventory Totals don't match what I've actually used	Check the blender's scale calibration and verify that the batch hopper is not overfilling. If the hopper is overfilling, adjust your batch size. If this is correct, then you are probably not accounting for material scrap or other items in your process.
	Some error can be introduced by not weighing every batch. Check the Recipe Page.
Max Hopper Weight Exceeded Alarm continues to re-occur.	Stop the Blender and the Start it again. This causes the blender to perform an automatic feeder calibration. If this doesn't fix it, then manually perform feeder calibrations and retest.
Blender occasionally dumps an incorrect batch.	The blender intermittently dumps a batch of material with one or more of the components incomplete.
	Check the recipe information; ensure that both the percentages and batch size are set properly.
	Check the status of the alarm flags & Feeder Setup to ensure that all of the feeders are set to Retry. In addition, if the blender is configured for timed batches then this can cause error.
	Check supply hopper ventilation to prevent problem associated with leaky vacuum receiver flappers.
Blender keeps dumping after mixer is full.	Check the mixer high-level switch sensitivity. When the sensor is covered by material, the indicator lamp on the back of the switch should be lit. To adjust the sensitivity, use the small adjustment screwdriver that was provided with the blender. The adjustment pot is located on the back of the sensor. Rotate clockwise to increase the sensitivity (less material in front of the switch to actuate it). Rotate counter clockwise to decrease the sensitivity (more material covering the switch).
	Check the mixer high-level sensor connection to the control panel.
Blender will not batch with empty mixer.	Check the mixer high-level switch sensitivity. Fines may have coated the level switch; it needs readjustment.
	Check the proximity switch connection.
	Make sure that the recipe is correct.
	Check batch size.

Problem	Corrective action
Mixer won't shut off and runs continuously.	Check the Mixer and Dump Setup to see if the mixer is configured for "Continuous Mixing". Set it to "Timed Mixing".
	Check the value of the mixer timer setting.
	Check the value of the dump delay timer.
	Check the mixer motor fuse. This is located in the control panel on the SSR for the mixer motor. If the unit has two (2) power inlets with a separate power inlet for the mix motor the overload fuse will be located in the rear junction box on the blender frame.
	Check the power source to the blender.
	Check the load cell in diagnostics under direct scale readout. Place a calibration weight on the weigh hopper; determine if the weight corresponds.
	Check the load cells to make sure that a pellet has not jammed under a load cell.
	Check the load cell connections to the control panel
	Check the power supply voltage and readjust as necessary as described earlier.
	Check the memory battery voltage on the CPU board. If the battery is dead, the blender "forgets" settings when the power is off. Replace it with a new battery. Order a spare CPU board; send the replaced one back to the factory to have a new battery holder and battery installed. If this is done in the field, *the controller warranty will be voided*.
Out of Material Alarm is displayed, but there is material in the hopper.	Go to the Manual Control Page and check to see if "Hop Low" equals "1". If it does, then adjust the low-level prox until the value reads "0".
	Ensure that the material hopper is properly vented. If the vacuum receiver is leaky, then this will cause the problem. To test this, fill up the hopper and turn the loader off to prevent leaking.
	If this isn't the problem, then increase the "Out of Material Retry Limit" found under Feed Algorithm Options (see manual).
I'm not getting Out of Material Alarms	Check the Alarm Flags & Feeder Setup to see if the feeder is configured to give you an alarm.
Calibration Weight Exceeded	Clean out the hopper and retest. If this doesn't fix the problem, then perform a scale calibration. Also, check to sure that the Dump Time is not set extremely low. If all else fails, check the value set for the Max Empty Weight. This might need to be increased.
The feeder calibration values are moving too much.	First, check that the displayed actual dispensed weight is accurate. If this is OK, then check to see if the hopper is properly vented. To do this, fill hopper and turn off the loader and retest.

Problem	Corrective action
I can't calibrate the Scale without an error message.	This Is caused by the difference in bits not being large enough. Using the Direct Scale Readout, examine current loadcell bits with and without the calibration weight. If the bits do not change significantly, then check for pellets jamming the loadcells and check the loadcell circuit. You might have a bad loadcell.
I can't calibrate the feeder without an error message.	Do other feeders calibrate correctly? Is the feeder I'm trying to calibrate a large gate? If these are true, then lower the Batch % for Feeder Cal setting under Feed Calibration Options. This can be observed by looking at the Hopper Weight display.
	None of the feeders calibrate? Check the Scale Calibration. If this is correct, then lower the Batch% for Feeder Cal setting under Feed Calibration Options for each feeder. This can be observed by looking at the Hopper Weight display.
Weigh hopper does not empty completely.	Check the dump time setting. It may be set too short.
	If this does not correct the problem, clean the weigh hopper and recheck the scale diagnostics readout. If not showing (0) zero when empty, re-calibrate the scale.
Blender does not make rate.	Verify application is not exceeding blender capacity.
	Verify additive percentage is not higher than designed, resulting in excessive dispense time.
	Verify all materials are feeding freely through the metering gates or augers.
I have changed the recipe entry mode, metering order, batch size, inventory shutdown, weigh every batch mode, or feeder type and alarm flags, but the change hasn't taken place.	All of these settings are part of the current running recipe. This makes it easy for the operator to load a stored recipe without having to reconfigure all of these parameters for the new recipe. All you have to do is touch "Accept New Recipe" to load these values into the running recipe.
A feeder always puts too much material in the batch.	Check that the Gate Cycle Time is set correctly. If it is then lower the Initial % of Target to Meter. These are found under Feed Algorithm Options. Make small adjustments and retest.
A feeder is retrying more than 2-4 times.	Increase the Gate Cycle Time. This is found under Feed Algorithm Options. Make small adjustments and retest.
	Increase the Allowed Underfeed value under Feed Algorithm Options.
	Decrease the Retries before Double Gate Time.

Note: **Other service problems or questions can be answered by contacting the Service Department.**

Chapter 7: Appendix

7-1   Technical Specifications

Equipment Specifications

Figure 52: Equipment Specifications

Dimensions and Specifications		150	500	900	2500	4000	6000
Maximum Blending Rate, lbs/hr (kgs/hr) (3)		150 (68)	500 (227)	900 (410)	2500 (1135)	4000 (1815)	6000 (2725)
Number of Materials to be Blended		2 to 4	2 to 6	2 to 8			
Slide Gate Size - Majors, in. (mm)		2.0 (50)	2.0 (50)		2.5 (63)	4.0 (102)	
Slide Gate Size - Minors, in. (mm)		1.5 (38)	1.5 (38)		2.0 (50)	3.0 (76)	
Supply Hopper Capacity - Majors, cu.ft. (l.) (4)		0.7 (20)	2.5 (70)		5.2 (145)	14.3 (400)	
Supply Hopper Capacity - Minors, cu.ft. (l.) (4)		0.2 (5)	1.8 (50)		3.6 (100)	10.2 (285)	
Weigh Hopper Capacity, cu.ft. (l.)		0.07 (2)	0.18 (5)	0.38 (11)	0.82 (23)	1.23 (34)	2.17 (61)
Typical Batch Size, lbs. (kgs)		1.5 (0.7)	4 (1.8)	8 (3.6)	25 (11.3)	35 (15.8)	45 (20.4)
Load Cell Capacity, kgs		1 @ 5 kg	2 @ 3 kg	2 @ 5kg	2 @ 10 kg	2 @ 15 kg	2 @ 20 kg
Mixer Capacity, cu.ft. (l.)		0.18 (5)	0.25 (7)	0.56 (16)	1.1 (31)	2.72 (77)	
Mixer Motor Size, HP (kw)		1/8 (0.09)	1/6 (0.124)		1/3 (0.248)		
Mixer RPM		42	21		22		
Blended Material Discharge Opening, in. (mm)		2.5 (63)	3.0 (76.2)		4.0 (102)		
Weight of Machine (approx.), lbs. (kgs)		250 (115)	375 (170)	450 (205)	650 (295)	1100 (500)	
Shipping Weight (approx.), lbs. (kgs)		350 (160)	475 (215)	550 (250)	800 (360)	1300 (590)	
Approximate Dimensions, in. (mm)	Height (5)	34.5 (875)	51.5 (1308)	56.5 (1435)	69.5 (1765)	85.5 (2172)	89.5 (2273)
	Width (5)	26.0 (650)	37.5 (952)	37.0 (940)	45.5 (1156)	57.5 (1461)	
	Depth (5)	22.0 (560)	37.0 (940)	40.0 (1016)	46.5 (1181)	57.0 (1448)	

(1) Blender models with 7th and 8th component metering include Allen-Bradley 10 inch color touch screen standard.

(2) Compressed air loaders cannot be used to load 150 # blenders.

(3) See page 2 for important rate information concerning each model's maximum blending rate.

(4) Hopper capacity measured as level full volume. Capacity reduced when loaded automatically.

(5) Measurements describe standard unit without feeder or R.A.M. hoppers.

Annex B Information

The following design information is provided for your reference:

1. No modifications are allowed to this equipment that could alter the CE compliance
2. Ambient temperature: 40 degrees Celsius – Maximum (104 degrees Fahrenheit)
3. Humidity range: 50% relative humidity
4. Altitude: Sea level
5. Environment: Clean, dust-free and non-explosive
6. Radiation: None
7. Vibration: Minimal, i.e. machine mounting
8. Special installation requirements: Clean, dry compressed air 1 cfm @ 60 psi (1.7 m³/hr @ 4.14 bar)
9. Allowable voltage fluctuation: +/- 10%
10. Allowable frequency fluctuation: Continuous +/- 1%
    Intermittent +/- 2%
11. The addition of an auger feeder (RAM option) for regrind will increase the electrical supply requirements of a standard blender.
12. Nominal supply voltage: 120/1/60 or 220/1/50/60 (Verify on serial number tag)
13. Earth ground type: TN (system has one point directly earthed through a protective conductor)
14. Power supply should include a neutral power connection.
15. Over-current protection is supplied in the blender, but additional protection should be supplied by the user.
16. The plug on the power cord serves as the electrical disconnect device.
17. Unit is not equipped with three-phase motors.
18. N/A
19. Blender is not equipped with local lighting.
20. Functional identification
21. Blender is equipped with a CE mark
22. Blender is supplied with an operating manual in the language of the destination country.
23. Cable support may be required for power cord, depending on final installation.
24. No one is required to be in the interior of the electrical enclosure during the normal operation of the unit. Only skilled electricians should be inside the enclosure for maintenance.
25. Doors can be opened with a screwdriver, but no keys are required.
26. Two-hand control is not required or provided.
27. All blenders should be moved around and set in a place with a lift truck or equivalent.
28. There are no frequent repetitive cycles that require manual control—repetitive functions are automatic while the blender is operating.
29. An inspection report detailing the functional test is included with the blender.
30. The machine is not equipped with cableless controls.
31. Color-coded (harmonized) power cord is sufficient for proper installation.

7-2   Drawings and Diagrams

Final Assembly
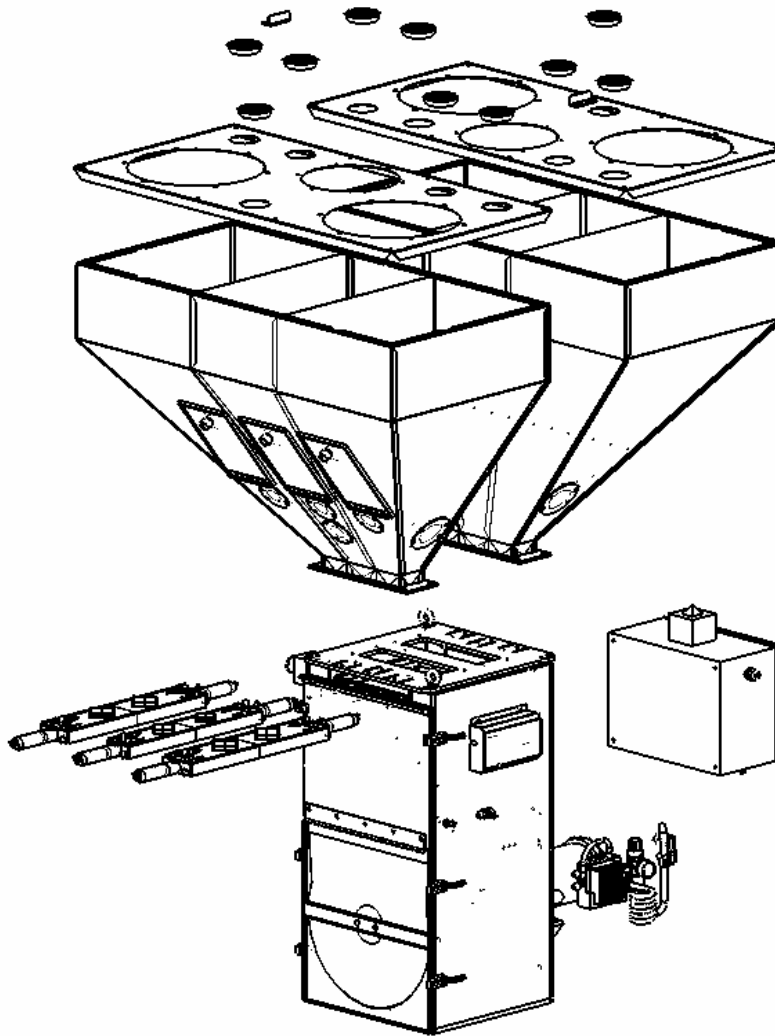
Figure 53: Typical Final Assembly Parts List

#	Description	150		900	2500	4000	6000
1	Mixer Assembly	A0771677	A0771682	A0771683	A0771663	A0771691	A0771692
2	3-Component Hopper Assembly	N/A	A0771687		A0771664	A0771700	
	2-Component Hopper Assembly	N/A	A0771686		A0771665	A0771699	
	Removable Hopper Small	CTB01648	N/A				
	Removable Hopper Large	CTB02248	N/A				
3	Slide Gate Assembly – Majors	N/A	A0771661		A0771660	A0771701	
	Slide Gate Assembly – Minors		A0771680		A0771661	A0771708	
4	Valve Stack Assembly 4-Comp	N/A	A0770375				
	Valve Stack Assembly 6-Comp		A0770376				
5	Main Controller	A0569133			A0569134		
6	Main Display (Not Shown)	A0574219					
7	Calibration Weight (Not Shown)	822.00334.00	822.00151.00	822.00152.00	A0571769	822.00153.00	
8	Hopper Support Straps	N/A			A0569157	872.00246.00	
9	Louvers – Hopper Covers	N/A	A0567625				

Mixer Sub-Assembly
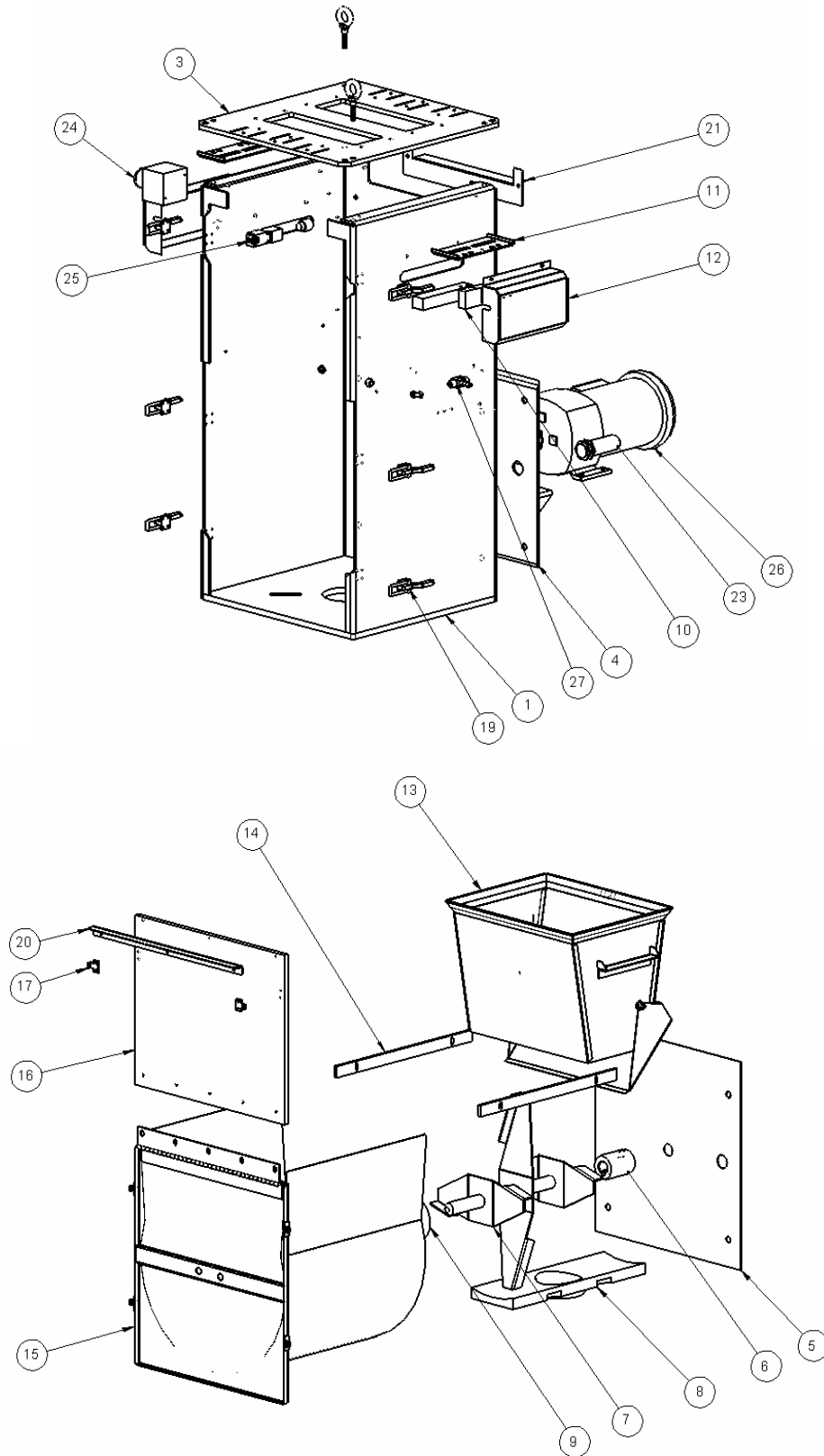
Figure 54: Typical Mixer Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	FRAME	872.00093.00	872.00094.00	A0770301	872.00224.00	
2	FRAME EXTENSION (NOT SHOWN)	N/A				872.00225.00
3	TOP PLATE	872.00095.00	872.00096.00	A0770300	872.00226.00	
4	MOUNTING BRACKET – MIXER MOTOR	872.00097.00	872.00098.00	A0770316		
5	MIX CHAMBER BACK PLATE	872.00099.00	872.00100.00	A0770333	872.00227.00	
6	COUPLING – AGITATOR DRIVE	832.00010.00		A0770318		
7	AGITATOR – MIXING	872.00101.00	872.00102.00	A0574115	872.00228.00	
8	DRAWER SUPPORT	832.00011.00		A0770320	832.00034.00	
9	BUSHING – AGITATOR	832.00012.00		A0770319	21063	
10	LOADCELL (TWO)	724.00767.00	724.00768.00	724.00770.00	724.00771.00	724.00772.00
11	MOUNTING BRACKET – WEIGH HOPPPER	A0770313				
12	COVER GUARD – LOADCELL	A0770322				
13	WEIGH HOPPER	872.00103.00	872.00104.00	A0770312	872.00229.00	872.00230.00
14	STOP RAIL – MIXER DRAWER	872.00105.00	872.00106.00	A0770314	872.00231.00	
15	MIXER DRAWER	872.00107.00	872.00108.00	A0770315	872.00232.00	
16	ACCESS DOOR – MIXER	832.00013.00	832.00014.00	A0770303	832.00035.00	832.00036.00
17	DOOR CLIPS	09990				
18	SAFETY COVER – MIXER FRONT (NOT SHOWN)	872.00109.00	N/A			
19	DOOR LATCH	35454				
20	SUPPORT BRACE – MIXER DOOR	N/A	872.00110.00	A0770332	872.00233.00	
21	SAFETY COVER – MIXER BACK	872.00111.00	872.00112.00	A0770302	872.00234.00	
22	MOUNTING BRACKET – CONTROL PANEL (NOT SHOWN)	872.00124.00		N/A		
23	PROXIMITY SENSOR – MIXER HIGH-LEVEL	A0556548				
24	E-STOP SAFETY DISCONNECT SWITCH	64269				
25	SAFETY DISCONNECT SWITCH – MIXER DOOR	A0567124				
26	GEAR MOTOR	720.00001.00		720.00002.00		
27	FLOW VALVE 1/4" TUBING	A0770190				

Hopper Sub-assembly
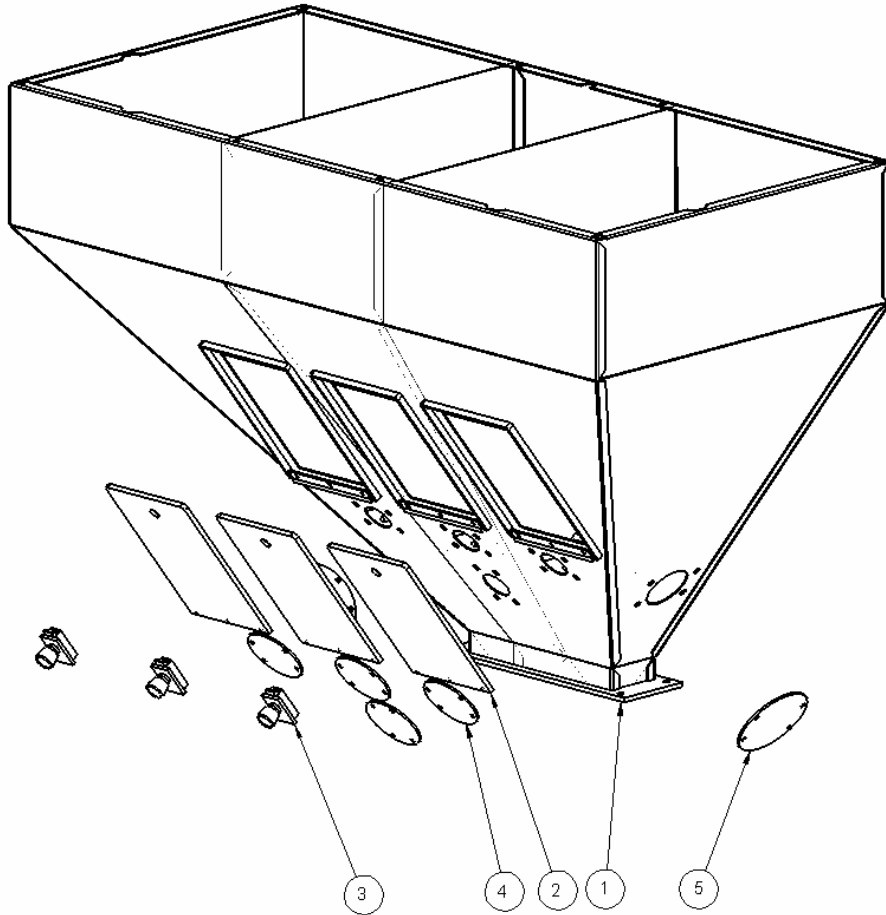
Figure 55: Typical Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	3-COMPONENT HOPPER	872.00118.00		A0569131	872.00240.00	
	2-COMPONENT HOPPER	872.00119.00		A0770299	872.00241.00	
3	LEXAN DOOR	A0770286				
4	DOOR LATCH	A0770076				
5	3.5" SIGHT GLASS	A0569154			N/A	
6	4.5" SIGHT GLASS	N/A		A0770323		
7	(OPTIONAL) 2" DRAIN W/ MANUAL GATE (NOT SHOWN)	A0569162			N/A	
	(OPTIONAL) 3" DRAIN W/ MANUAL GATE (NOT SHOWN)	N/A		A0569163		
8	(OPTIONAL) BRACKET - LOW-LEVEL SENSOR (NOT SHOWN)	A0569155				
9	(OPTIONAL) PROXIMITY SENSOR LOW-LEVEL (NOT SHOWN)	A0556548				

Hopper R.A.M. (Regrind Auger Metering) Sub-Assembly (Optional)
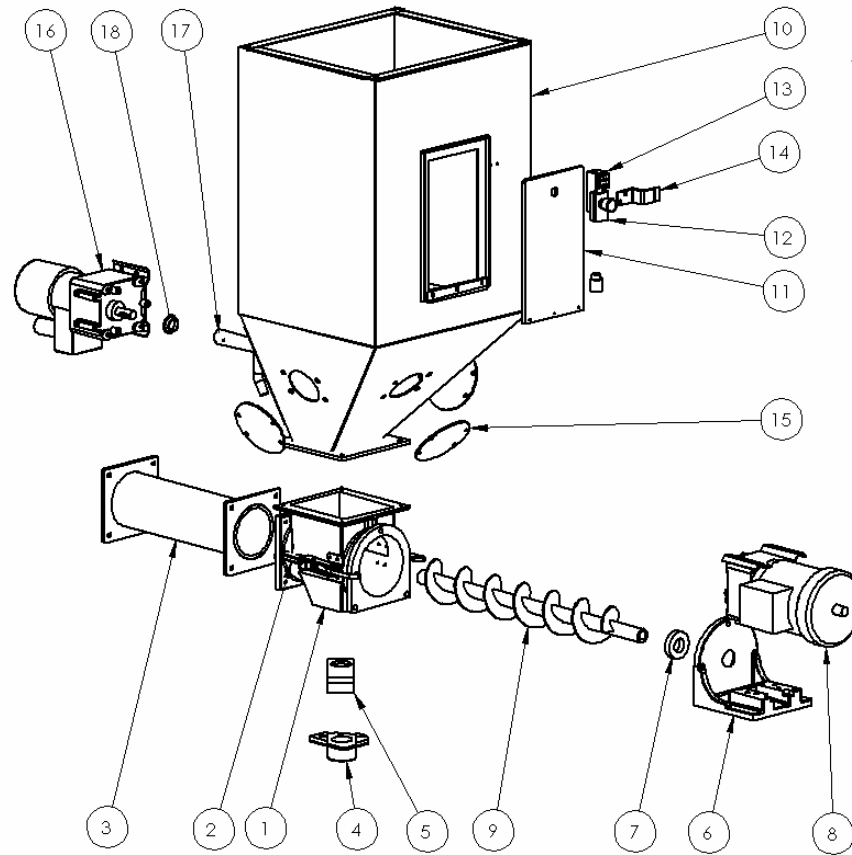
Figure 56: Typical R.A.M. Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	THROAT			07822-1		
2	CLAMP			A0548808		
3	FEEDER TUBE		#	872.00426.00	#	
4	DRAIN HOUSING			08806A-HYD		
5	DRAIN SLIDE GATE			08806B		
6	MOTOR MOUNT BRACKET			08451		
7	SEAL – AUGER - TEFLON			55372		
8	MOTOR - AUGER			720.00004.00		
9	AUGER		#	872.00421.00	#	
10	HOPPER 2.0 CU.FT.		872.00417.00		N/A	
	HOPPER 7.0 CU.FT.		N/A		872.00418.00	
11	DOOR			A0770286		
12	LATCH			A0770076		
13	SAFETY INTERLOCK SWITCH			A0567124		
14	BRACKET – SAFETY SWITCH			872.00431.00		
15	SIGHTGLASS 4.5"			A0770323		
16	MOTOR – AGITATOR			51489		
17	AGITATOR			10637		
18	SEAL – AGITATOR - RUBBER			15286		
19	RECEPTACLE – 3-PIN FEMALE			63119		
20	CORD 3-PIN MALE 6 FT LONG			55196		
21	STEADY STATE RELAY – 10 AMP			729.00183.00		
22	GLASS FUSE – 3.0 AMP (115V UNIT)			A0542207		
	GLASS FUSE – 1.5 AMP (230V UNIT)			A0542200		

Hopper Additive Feeder Sub-Assembly (Optional)
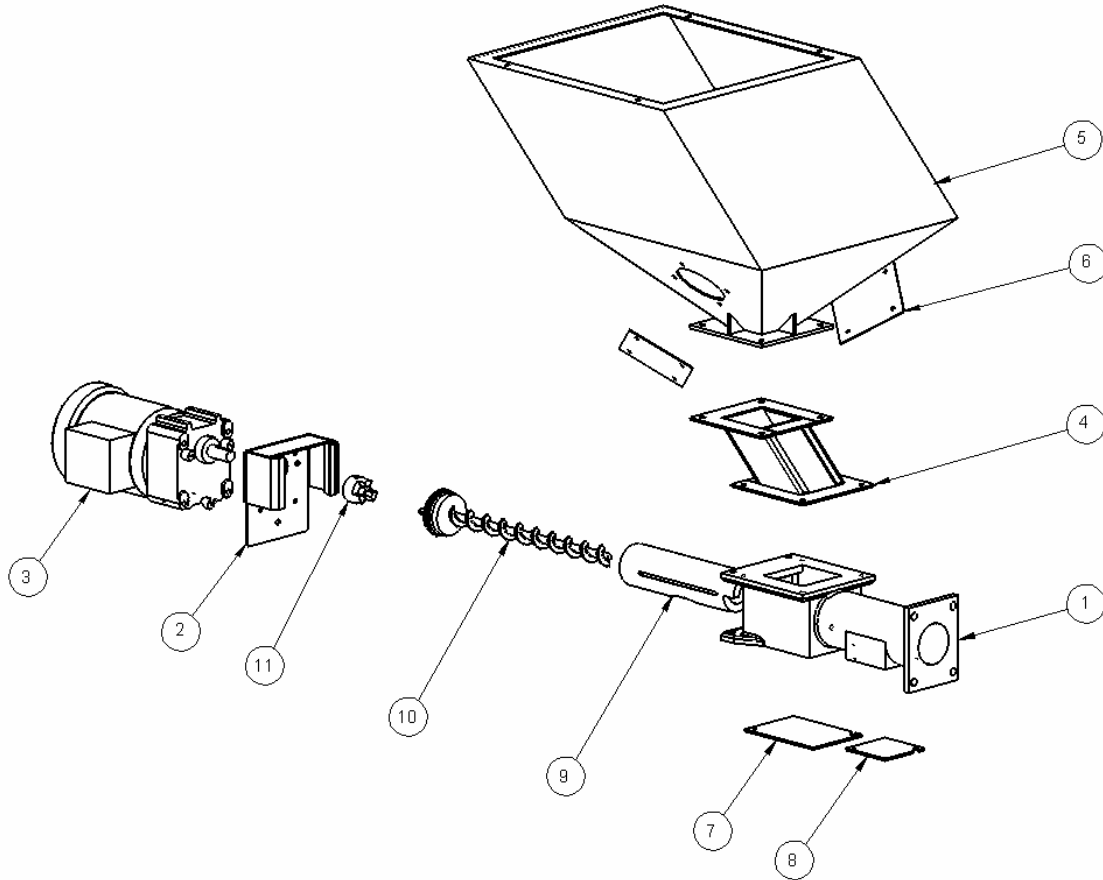
Figure 57: Typical Additive Feeder Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	THROAT			A0541201		
2	MOTOR MOUNT BRACKET			A0541229		
3	MOTOR – AUGER			51450G		
4	THROAT ADAPTER – 2" RISER		872.00537.00		N/A	
5	HOPPER 1.0 CU.FT.		A0541207		N/A	
	HOPPER 2.0 CU.FT.		N/A		A0541208	
6	SIGHTGLASS – AF			A0541206		
7	COVER PLATE – HOPPER CLEANOUT			A0541215		
8	COVER PLATE – SAMPLE PORT			A0541216		
9	TRANSFER TUBE – 1" AUGER		A0541211		#	
10	AUGER ASSEMBLY – 1" AUGER		A0541294		#	
11	COUPLING – MOTOR/AUGER			A0541282		
12	PIN – MOTOR MOUNT (NOT SHOWN)			A0541277		
13	RECEPTACLE – 3-PIN FEMALE (NOT SHOWN)			63119		
14	CORD 3-PIN MALE 6 FT LONG (NOT SHOWN)			55196		
15	STEADY STATE RELAY – 10 AMP (NOT SHOWN)			729.00183.00		
16	GLASS FUSE – 3.0 AMP (115V UNIT) (NOT SHOWN)			A0542207		
	GLASS FUSE – 1.5 AMP (230V UNIT) (NOT SHOWN)			A0542200		

Weigh Hopper Sub-assembly
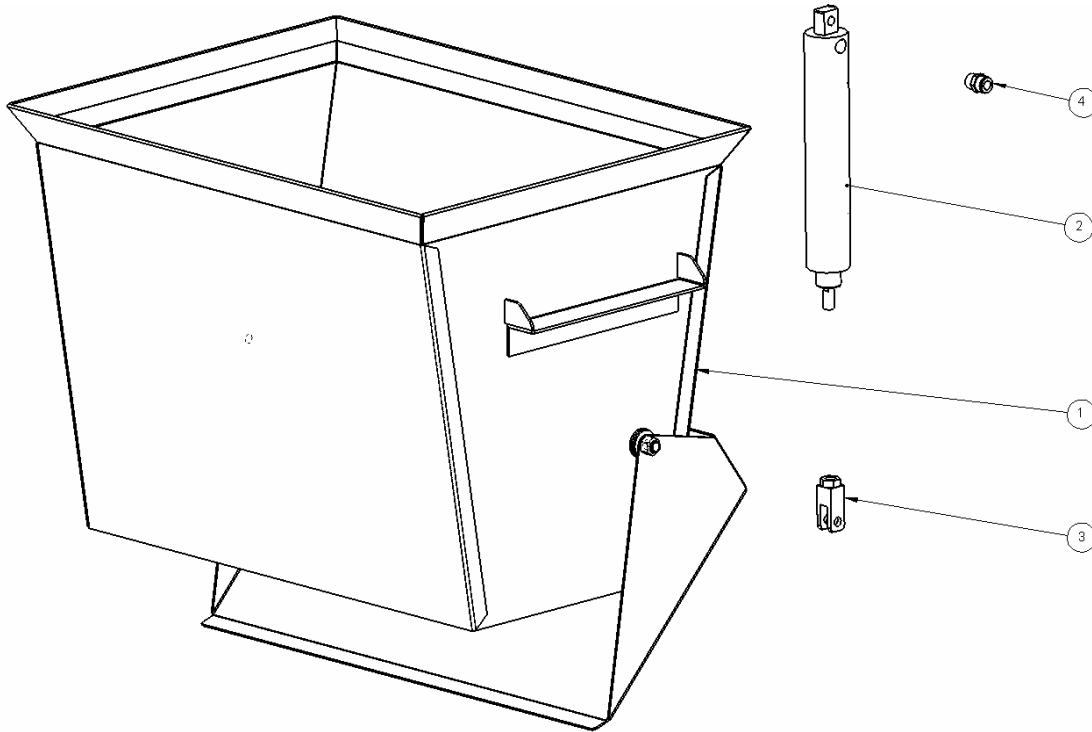
Figure 58: Typical Weigh Hopper Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	WEIGH HOPPER	872.00103.00	872.00104.00	A0770312	872.00229.00	872.00230.00
2	AIR CYLINDER	245.00003.00		A0770248		
3	CLEVIS – AIR CYLINDER	35460		35449		
4	FITTING – AIR TUBING	35086K			35085K	
5	AIR TUBING (NOT SHOWN)	35300K				

Slide Gate Sub-assembly
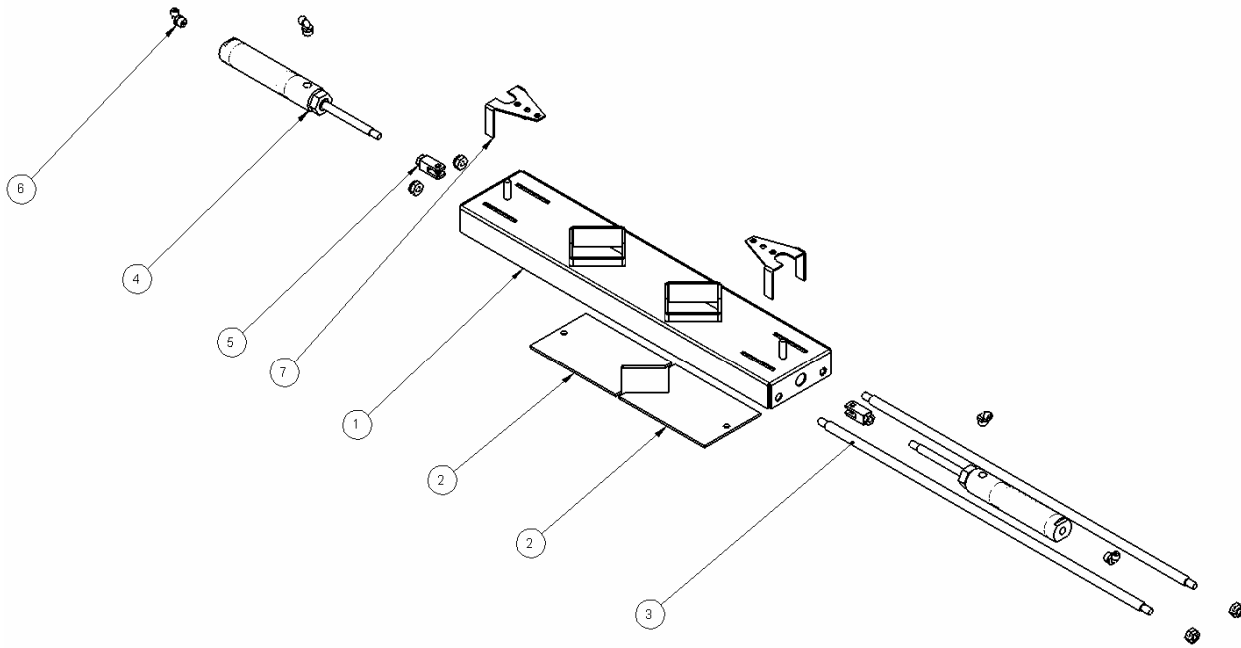
Figure 59: Typical Slidegate Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
	HOUSING (DOUBLE DIAMOND) (#1-4)	872.00114.00		A0770304	872.00524.00	
1	HOUSING (SQUARE / DIAMOND) (#1-4)	A0770308		N/A	872.00235.00	
	HOUSING (DOUBLE DIAMOND) (#5-6)	872.00113.00		A0770308		
	GATE – DIAMOND (#1-4)	A0770309		A0770305	872.00237.00	
2	GATE – SQUARE (#1-4) (NOT SHOWN)	872.00116.00		N/A	872.00236.00	
	GATE – DIAMOND (#5-6)	872.00115.00		A0770309	872.00237.00	
3	GUIDE ROD (#1-4)	A0770311		A0770307	832.00037.00	
	GUIDE ROD (#5-6)	832.00015.00		A0770311		
4	AIR CYLINDER (#1-4)	35448		35448	245.00016.00	
	AIR CYLINDER (#5-6)	245.00006.00				
5	CLEVIS – AIR CYLINDER (#1-4)	35449		35449	A0770296	
	CLEVIS – AIR CYLINDER (#5-6)	35460				
6	FITTINGS – AIR CYLINDER	A0770136				
7	STROKE LIMITER (#1-4)	A0770310		A0770306	872.00238.00	
	STROKE LIMITER (#5-6)	82.00117.00		A0770310		
8	QUICK RELIEF VALVES (NOT SHOWN)	N/A			245.00024.00	

Knife Gate Sub-assembly HD (Optional)
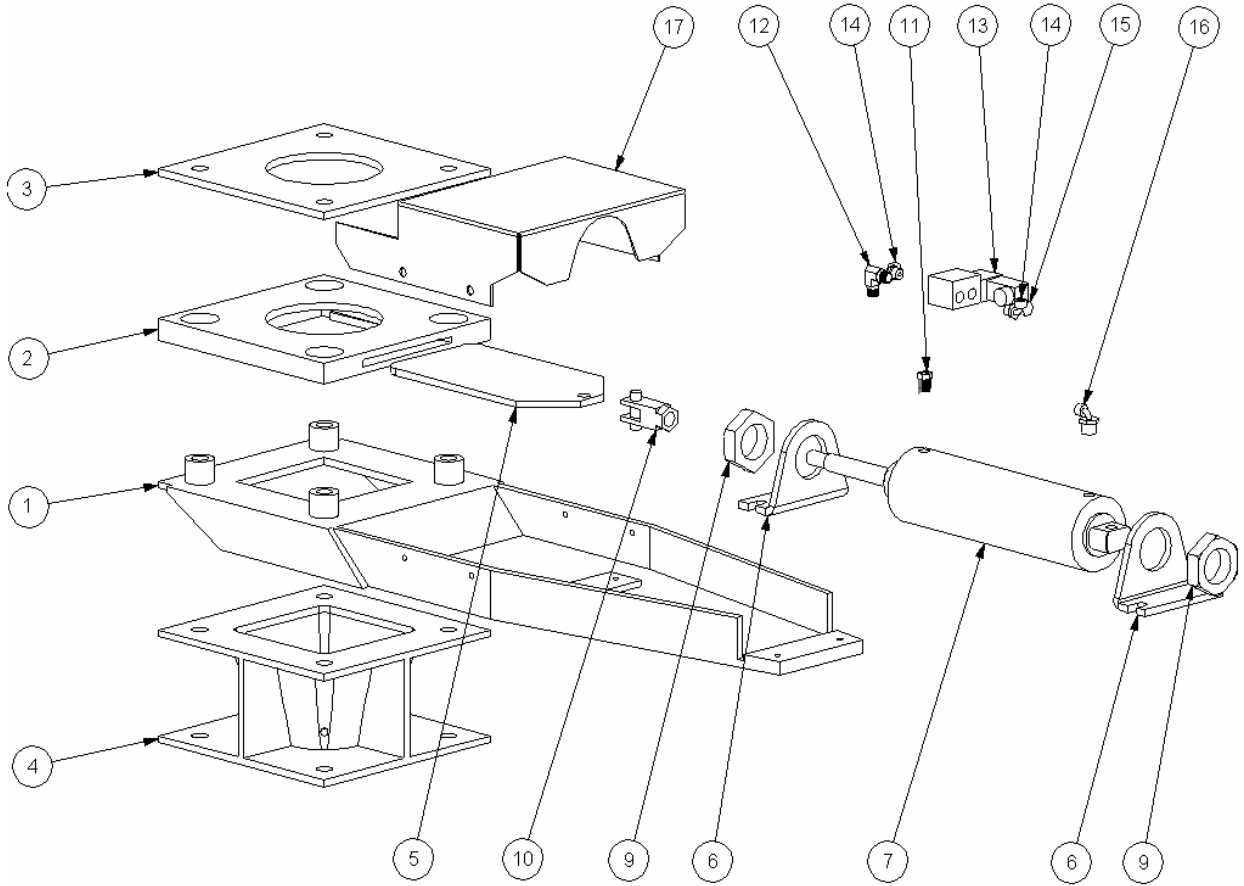
Figure 60: Typical Knife Gate (below mixer) Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	BASE FRAME			07990		
2	MOLDED THROAT			53413		
3	SPACER PLATE			08286		
4	FLANGE ADAPTER			08292		
5	KNIFE BLADE			10644		
6	MOUNTING BRACKET – AIR CYLINDER			33088		
7	AIR CYLINDER			33091		
8	-			-		
9	MOUNTING NUT – AIR CYLINDER			A0553239		
10	CLEVIS – AIR CYLINDER			33090		
11	BUSHING 1/4 - 1/8 NPT			35014		
12	ELBOW 1/8 NPT			35118		
13	SOLENOID 4-WAY 24VDC			33128		
14	FITTING – 1/8 NPT X 1/4 TUBE			35086K		
15	MUFFLER 1/8 NPT FLUSH			35157		
16	FITTING – 1/4 NPT X 1/4 TUBE			35154		
17	SAFETY SHIELD	A0770362	A0770363	A0770364	A0770365	
18	STROKE LIMITER PIPE (NOT SHOWN)			07990B		

Knife Gate Sub-assembly RD (Optional)
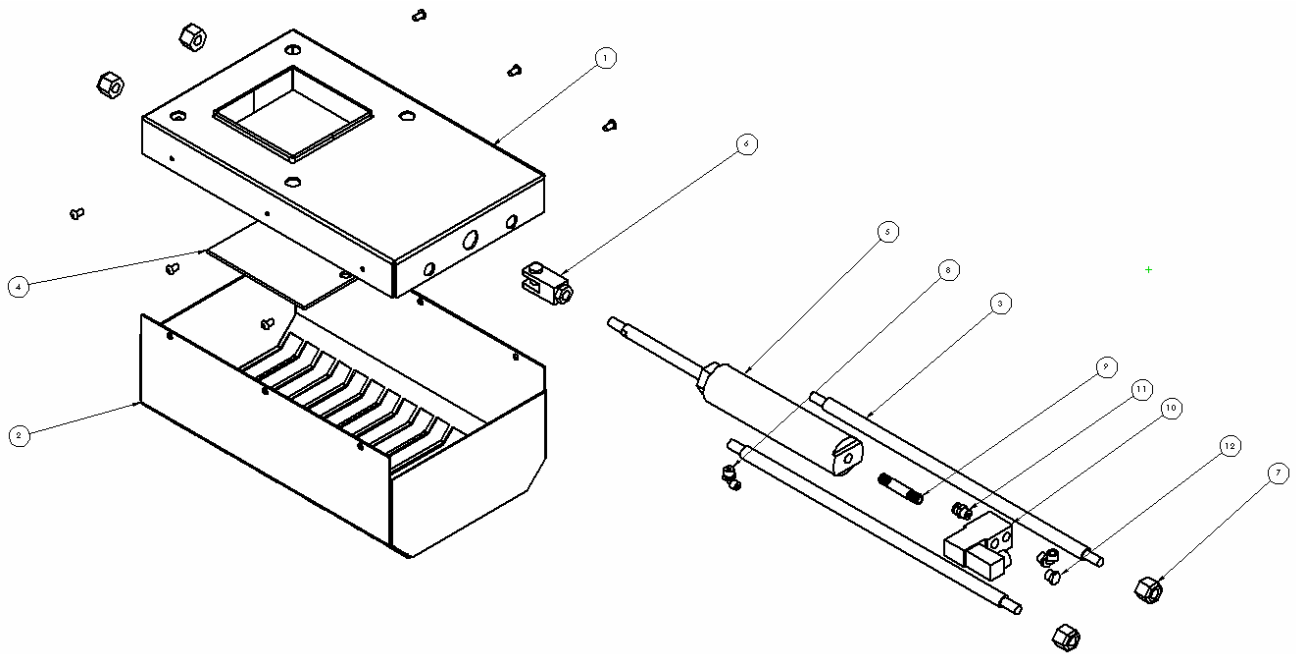
Figure 61: Typical Knife Gate (floor stand) Assembly Parts List

#	DESCRIPTION	500	900	2500	4000	6000
1	HOUSING FRAME			872.00297.00		
2	GUARD SAFETY COVER			872.00236.00		
3	ROD GUIDE			832.00049.00		
4	GATE – SLIDE BLADE			872.00236.00		
5	AIR CYLINDER			245.00016.00		
6	CLEVIS – AIR CYLINDER			A0770296		
7	NUT – LOCKING			A0533826		
8	FITTING ELBOW 1/8 NPT X 1/4 TUBE			35086K		
9	NIPPLE 1/8 NPT			A0015494		
10	SOLENOID 4-WAY 24VDC			33128		
11	FITTING STRAIGHT 1/8 NPT X 1/4 TUBE			35085K		
12	FITTING MUFFLER STONE 1/8 NPT			35157		

Control Panel Layout
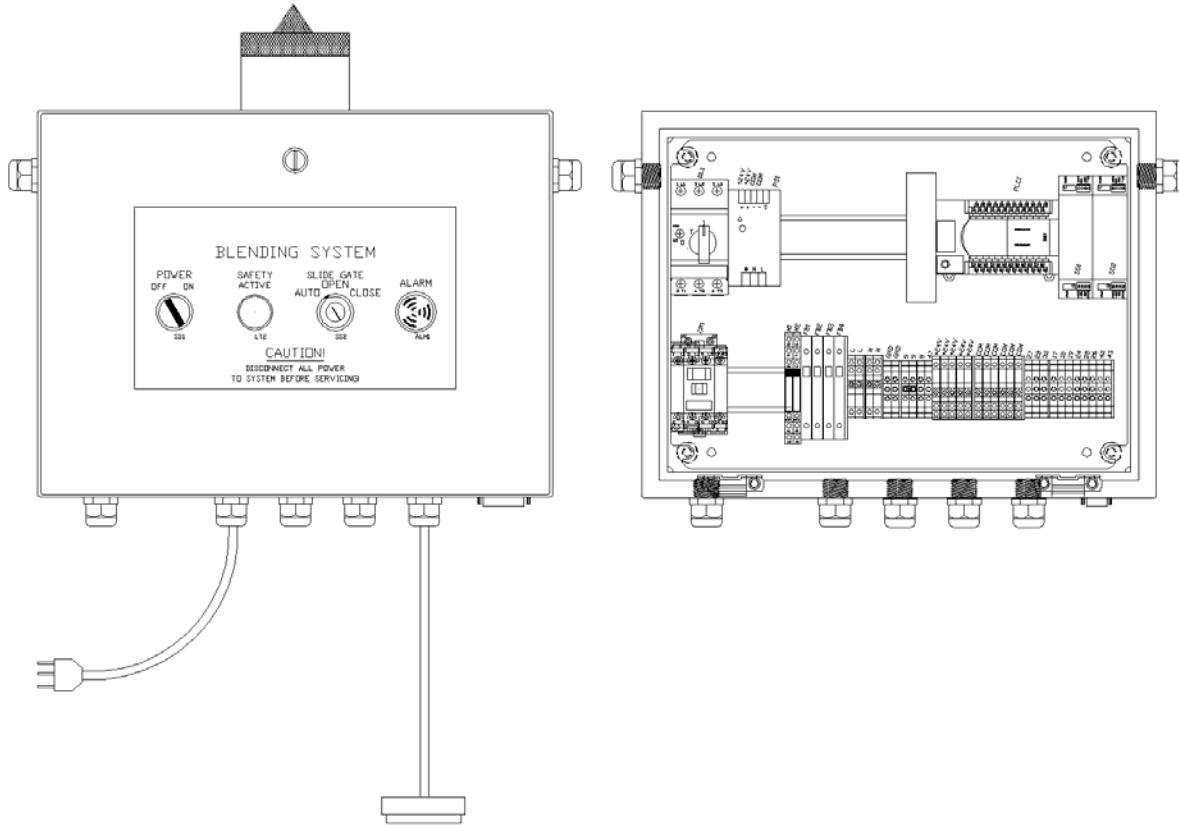
Figure 62: Typical Mitsubishi Controller Main Parts List

#	Description	150	500	900	2500	4000	6000
1	Mitsubishi PLC FX2N-32MR	A0569702					
2	Mitsubishi PLC EEPROM	A0569703					
3	24 vdc Power Supply	A0563932					
4	Calex Module – Load Cell Amplifier	724.00117.00					
5	Alarm Light Yellow Strobe 24 vdc	A0565889					
6	Alarm Horn 95db 24vdc	A0542574					
5	Glass Fuse – 1.5 amp (115v unit)	A0542200					
	Glass Fuse – 1.0 amp (230v unit)	A0540997					
6	Glass Fuse – 3.0 amp (115v unit)	A0542207					
	Glass Fuse – 1.5 amp (230v unit)	A0542200					
7	Motor Contactor	A0573025 (9 amp)			A0573026 (12 amp)		
8	Motor Overload – MCP (115v unit)	A0558252 (1.6-2.5 amp)			A0558255 (6.3-10.0 amp)		
	Motor Overload – MCP (230v unit)	A0558251 (1.0-1.6 amp)			A0558254 (4.0-6.3 amp)		
9	Light Bulb – Power Switch (115v unit)	A0544076					
	Light Bulb – Power Switch (230v unit)	A0567108					
10	Light Bulb – Safety Active 24vdc	A0565884					
11	Alarm Relay	A0567058					

Figure 63: Typical Mitsubishi Display Main Parts List

#	Description	150	500	900	2500	4000	6000
1	Mitsubishi Pendant Touchscreen Display	A0569706					
2	Display – 32 ft Connection Cable	A0569705					

7-3 Spare Parts Kits

Figure 64: Blender Spare Parts Listing

Model	150	500	900	2500	4000	6000
KIT "A" (Consumables)	**A0574120**	**A0574134**	**A0574137**	**A0574125**	**A0574140**	**A0574143**
Load Cell Assembly (without plug)	#	724.00767.00	724.00768.00	724.00770.00	724.00771.00	724.00772.00
Mixer High Level Sensor	#	A0556548				
(5) Fuses, 1.5 Amp	(5) A0542200					
(5) Fuses, 3.0 Amp	(5) A0542207					
KIT "B" (Minimal Downtime)	**A0574121**	**A0574135**	**A0574138**	**A0574126**	**A0574141**	**A0574144**
All "A" Kit Parts	A0574120	A0574134	A0574137	A0574125	A0574140	A0574143
Slide Gate Air Cylinder - Majors	#	35448			245.00016.00	
Slide Gate Air Cylinder - Minors	#	245.00006.00		35448	245.00016.00	
Weigh Hopper Air Cylinder	#	245.00003.00			A0770248	
Mixer Motor Contactor	A0573025			A0573026		
Power Supply, 24vdc	A0563932					
Mixer Door Safety Switch	#	A0567124 + A0567125				
KIT "C" (24/7 Operation, or International)	**A0574122**	**A0574136**	**A0574139**	**A0574127**	**A0574142**	**A0574145**
All "A" and "B" Kit Parts	A0574121	A0574135	A0574138	A0574126	A0574141	A0574144
Second Load Cell Assembly (without plug)		724.00767.00	724.00768.00	724.00770.00	724.00771.00	724.00772.00
Mixer Motor Protector (overload)	A0558252			A0558255		
Calex Module	724.00117.00					
Other Recommended Parts	**150**	**500**	**900**	**2500**	**4000**	**6000**
Mixer Gear Motor	#	720.00001.00		720.00002.00	720.00002.00	
Mixer Agitator	#	872.00101.00	872.00102.00	872.00225.00	872.00228.00	
Mixer Coupling	N/A	832.00010.00		832.00030.00		
Weigh Hopper Assembly	#	A0771684	A0771685	A0771662	A0771704	A0771705
Valve Stack Assembly	N/A	A0770132 (4-Component) -or- A0770144 (6-Component)				
MIT Pendant Operator Touch Screen	A0569706					
MIT PLC CPU	A0569702					
MIT PLC EEPROM	A0569703					
One of each of these parts is recommended if you have MULTIPLE blenders and rely on long term, continous operation.						

7-4   Addendum (Service Supervisor Information)

Note: **This section of the manual should not be used by untrained personnel – blender controller and/or program can be compromised!**

Note: **Hidden, programmable features and hidden menu pages should not be made available to floor operators. These pages include the Service Supervisor Information addendum located in this section. Unauthorized changes to these factory settings by inexperienced operators may prevent the unit from operating properly, and may void part or all of the warranty.**

Caution!   *After all selections are made: Keep pressing the "Done" key until the unit returns to the Recipe menu.*

Note: **Programmable features should not be accessed by inexperienced operators or inexperienced plant personnel. Unauthorized changes may prevent the blender from operating properly and may void part or all of the warranty.**

Note: **Call the Service Department for assistance or for further explanation of these or any other programmable features, which may or may not be shown in this manual.**

Note: **Information included in this manual is subject to change without notice.**

Passwords

- User Password   "5413"

- Maintenance Password   "3145348"

Caution!   *Maintenance password should only be supplied to qualified personnel! The program can be compromised.*

Programmable Settings

The Slide Gate/Auger blender software program has been designed to allow some customizing to achieve certain desired operating parameters. The following is a listing of the selections that are "field" programmable, followed by the procedure for doing so.

This menu is accessed by pressing the manufacturer's icon when in the "Setup" Directory Screen menu.

Figure 65: Typical Operator Setup Screen
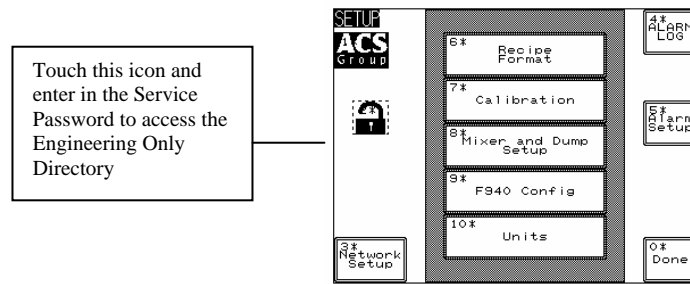
Enter the long password "3145348" and press "Enter". The factory setup section displays the "Engineering only" screen. The screen similar to that shown below should be displayed and use the keystrokes described herein to change or toggle the parameters.

Figure 66: Typical Engineering Only Setup Screen
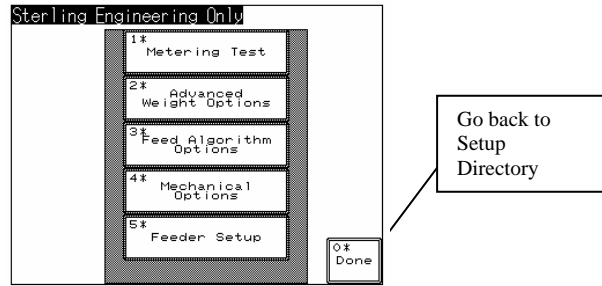

Factory Setup Menu

Metering Test Screen

This screen is useful in both R & D and development purposes when testing the metering performance of each feeder.   The user can perform a "Single Meter by Weight" to evaluate the mechanical standard deviation of the gate or auger. This test meters for the calculated time based off the target weight entered on this screen. The blender does not retry or adjust the time of the meter to reach the target, but instead always meters for the same amount of time as long as the target weight has not been changed. This allows you to open the gate for several feeds using the same amount of time. You can then record the Dispensed Grams and plot the standard deviation of the gate. The other purpose of this screen is to verify that the dispensed weight displayed is correct. You can perform a meter and then pull the weigh hopper to weigh the material on a gram scale. The value on the screen should match the measurement on the gram scale. If it does not, then either the weigh hopper is not balanced correctly or the scale calibration is not correct. Refer to the Troubleshooting Section of this manual for additional details.

Figure 67: Typical Metering Test Screen
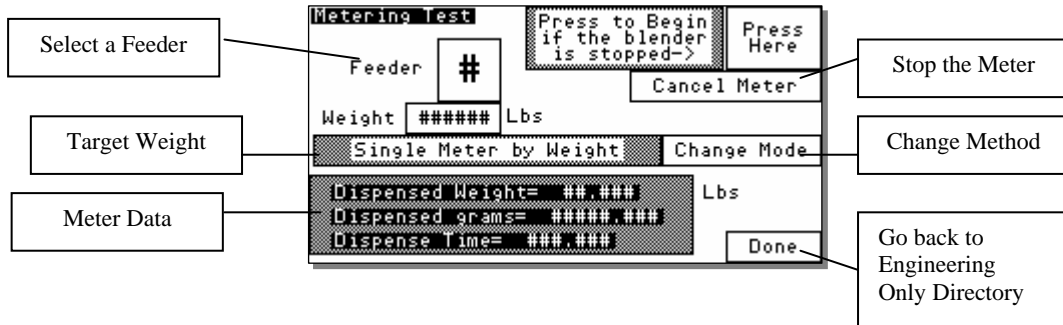
Advanced Weight Options Screen

This screen allows you to modify the weight filter, adjust the mechanical time to settle the weigh hopper after dumping, adjust the mechanical time to settle after a feeder has introduced material into the weigh hopper, adjust the Maximum Empty Weight of the hopper, and to enable the batch weight data to be dumped to a printer every batch for diagnostic purposes. The data that is dumped to a printer is the same data shown on the Recipe Screen. No averaging is done with the data shown to the Customer. Targets vs. Actual are actually what is in the batch without any "smoke and mirrors."

The weight filter is the specialized filter algorithm that smoothes erroneous load cell readings. The signal will be filtered more if this value is increased and less if decreased.

This setting should not be modified except by the developer except under unusual circumstances.

Figure 68: Typical Advanced Weight Options Screen
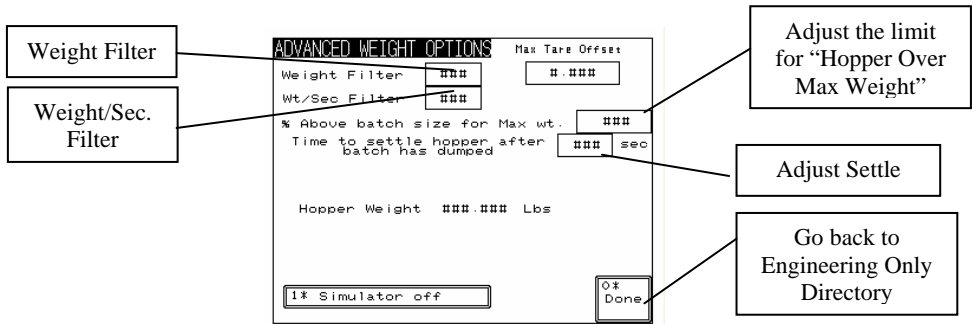
Feed Algorithm Options Screen

This screen allows the user to configure how the blender metering algorithm works. The user can adjust the Initial percentage of Target to Meter, the Allowed Underfeed value, the number of retries before Double Gate Time, the allowed Weight/Sec Drop, and the Out of Material retry limit.

Figure 69: Typical Feed Algorithm Options Screen
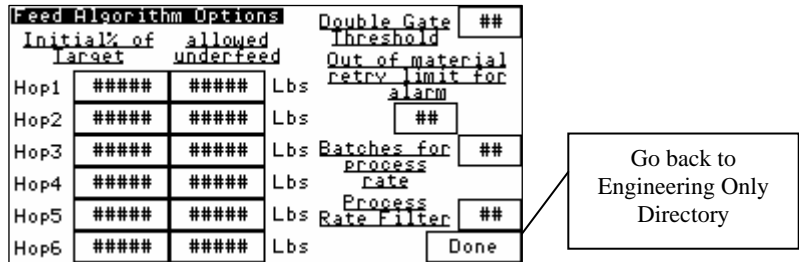
Feed Calibration Options Screen

This screen allows you to perform the feeder calibrations for each feeder (in weight per second). This is useful when the feed calibration is giving you an error message (most commonly caused by overfilling the hopper during the calibration). Select a feeder and then follow instructions. An error is shown if the current feeder calibration feed time was too short, the feed time was too long, or if the hopper weight exceeded 110% of the set batch weight. In the case that the feeder exceeded 110% (maximum hopper weight) due to a high rate hopper then the "Batch % for Feeder Cal" setting might be set too high. Consult the manufacturer if this problem arises. The current feeder calibration values are also shown on this page. *It is not necessary to perform feeder calibrations. The blender will automatically learn these values during the batch.*

Figure 70: Typical Feed Calibration Options Screen
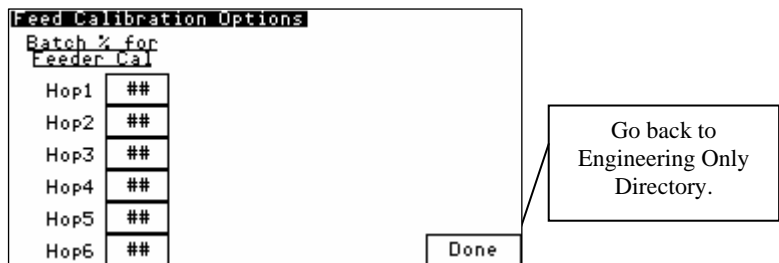
Mechanical Options Screen

This screen allows the user to change the number of hoppers, the predetermined gate cycle time, and the mixer bump time for detecting high level.

The gate cycle time has been measured and set at the factory, but might need to be adjusted if we change the mechanical design of the gate, solenoids, and air cylinders. This setting will vary depending on whether you are using a gate or an auger.

Figure 71: Typical Mechanical Options Screen

Feeder Setup

This screen allows you to modify the type of each feeder. In most cases, the user will want to keep regrind on hopper 3 because that blender has been specifically designed to handle the regrind. These settings should only be modified under special circumstances.

If the blender is configured in "EZ Mode" then one hopper must be configured for Regrind and only one hopper must be configured for Virgin material. If this is incorrect, a message will be given on the Recipe Screen.

Figure 72: Typical Feeder Setup Screen

Customer Setup Menu

Units

This screen allows the user to change the blender's unit of measurement. The entire blender can be configured in either Kgs. or Lbs., while the Target vs. Actual data can be configured for either regardless of the blender's units.

Figure 73: Typical Units Screen

Change Target vs. Actual Units

Change Blender's Units

Go back to Setup Directory

```
UNITS

Blender Data in Kgs.
Display Target/Actual in Lbs.

*NOTE:  If "Blender Data" is
changed from either KGS or
LBS you must recalibrate the
blender and reset the
inventory totals.  You must
also check inventory shutdown
levels and batchsize

Done
```
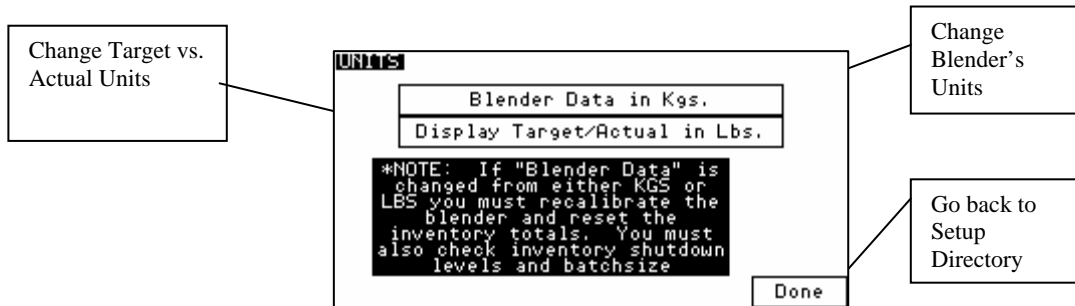
Network Setup

This screen allows the blender to be configured for use with the Ethernet Option. The blender will automatically configure the Ethernet module's IP Address and Subnet Mask if the configurator is enabled. Whenever you modify the IP Address or subnet, you either need to reboot the PLC.

Figure 74: Typical Ethernet Setup Screen

Enable or Disable the Ethernet Module

Go back to Setup Directory

```
ETHERNET SETUP

1 Communications Disabled

Communications is used for remote
communications to the blender.  This
must be disabled if you wish to use
the port for printing.  You must reboot
the PLC after making changes to this
parameter.

0 Done
```
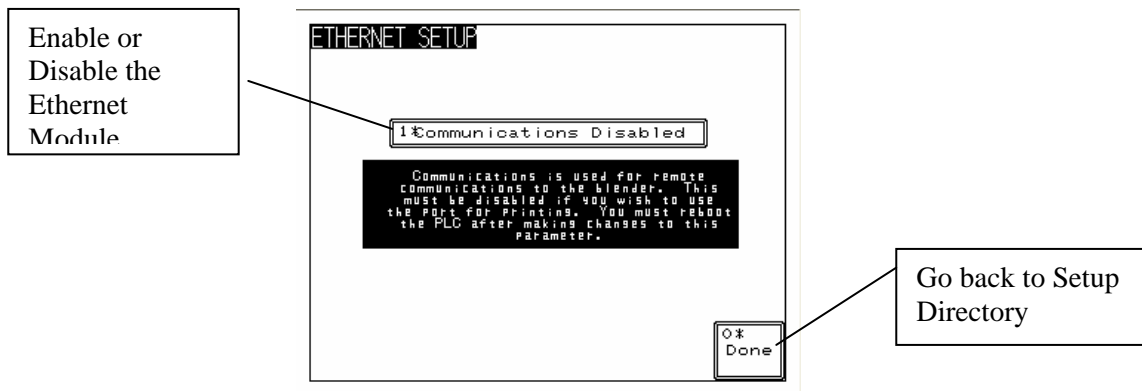
Alarm Setup

This screen allows the user to configure the feeder type for each feeder; configure whether a feeder will retry during the metering of a batch, and enable or disable the "Out of Material" alarm for any feeder. If a hopper is set to "No Retry" then the blender will continue to meter the rest of the batch even if this hopper runs out of material. No "Out of Material" alarm will be given regardless of how the alarm is configured unless the user has purchased and wired in the low level proximity switches in each hopper. To configure each hopper, perform the following steps:

1. Select a feeder by touching the "Select Feeder" box.

2. The current settings for that hopper will be shown.

3. Make the necessary adjustments and select a new feeder to configure if desired.

4. Hit "Done" to exit.

Figure 75: Typical Alarm Flags & Feeder Setup Screen
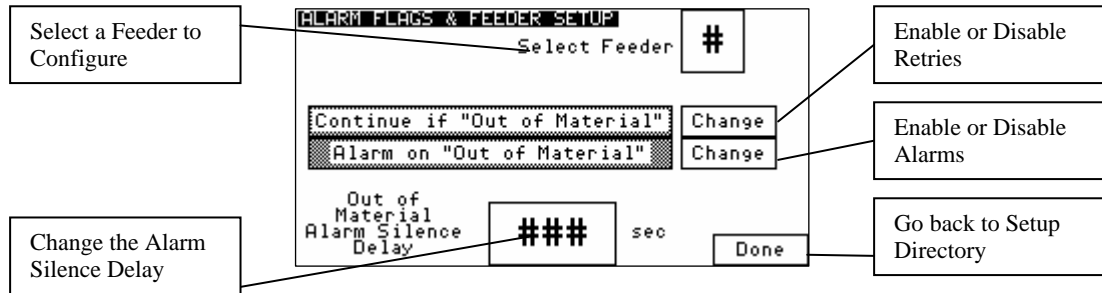
Alarm Log

This screen shows the last 100 stored alarms. The log can be viewed, printed and cleared.

Figure 76: Typical Alarm Log Screen

Factory Default Setup Parameters

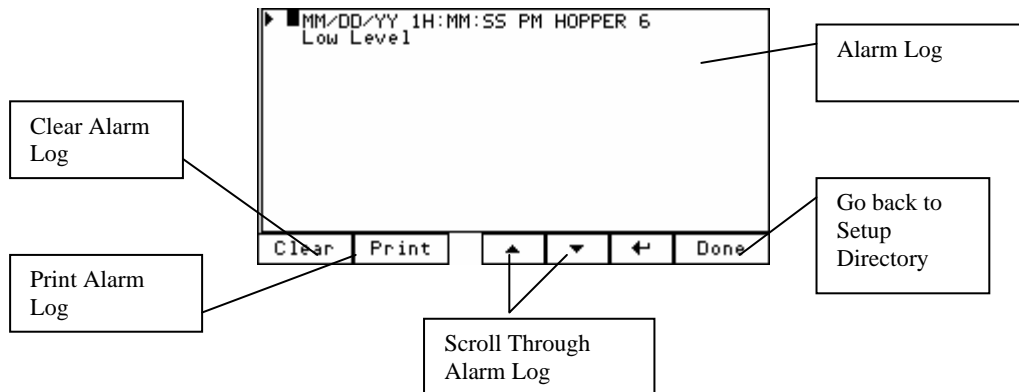| Model Number	150	500	900	2500	4000	6000
ALL WEIGHT VALUES RECORDED IN POUNDS						
(DIVIDE BY 2.20462 FOR KILOGRAMS)						
RECIPE FORMAT						
Recipe Entry Mode	PERCENTAGE	"EZ" MODE / "QUICK SET" MODE				
Metering Order	12345678					
Batch Size (lbs)	2.0	4.0	8.0	25.0	35.0	45.0
Inventory Shutdown	0					
Batch Ready Mode	ENABLED					
AutoStart Mode	ENABLED					
Weighing mode	EVERY BATCH					
REPORT SETUP						
Blender Number	1					
Auto Print Inventory	DISABLED					
Auto Clear Inventory	DISABLED					
Auto Print/Clear Interval	8					
Start Hour	0					
SCALE CALIBRATION						
PERFORM A SCALE CALIBRATION ON ALL MANUFACTURED UNITS						
DIRECT SCALE READOUT						
LOG THESE VALUES AFTER THE SCALE CALIBRATION WITH THE ORDER INFORMATION						
FEEDER CALIBRATION						
Hop1 wt/sec (lbs)	0.25	1.00		1.50	10.00	
Hop2 wt/sec (lbs)	0.25			3.00		
Hop3 wt/sec (with square gate) (lbs)	0.25	2.00		1.50	10.00	
Hop4 wt/sec (lbs)	0.25			3.00		
Hop5 wt/sec (lbs)	0.25			3.00		
Hop6 wt/sec (lbs)	0.25			3.00		
Hop7 wt/sec (lbs)	0.25			1.00		
Hop8 wt/sec (lbs)	0.25			1.00		
"Feeder Calibration wt/sec" values assume stroke limiters installed						
in hoppers #2 & #4 & #5 thru #8						
MIXER AND DUMP SETUP						
Mixing Time	4					
Remix Time	0					
Dump Time	1	2		4		
Dump Delay	0					
Dump Cycles	1	2		1		
Mixer Dump Time (w/o knifegate set to 0)	4			6		
Continuous/Timed Mixing	TIMED					
USER PASSWORD						
User Password	5413					
Maintenance Password	3145348					
ALARM SETUP						
Hop1 Continue/Stop on Out of Material	STOP					
Hop2 Continue/Stop on Out of Material	STOP					
Hop3 Continue/Stop on Out of Material	STOP					
Hop4 Continue/Stop on Out of Material	STOP					
Hop5 Continue/Stop on Out of Material	STOP					
Hop6 Continue/Stop on Out of Material	STOP					
Hop7 Continue/Stop on Out of Material	STOP					
Hop8 Continue/Stop on Out of Material	STOP					
Hop1 Alarm/No Alarm on Out of Material	ALARM					
Hop2 Alarm/No Alarm on Out of Material	ALARM					
Hop3 Alarm/No Alarm on Out of Material	ALARM					
Hop4 Alarm/No Alarm on Out of Material	ALARM					
Hop5 Alarm/No Alarm on Out of Material	ALARM					
Hop6 Alarm/No Alarm on Out of Material	ALARM					
Hop7 Alarm/No Alarm on Out of Material	ALARM					
Hop8 Alarm/No Alarm on Out of Material	ALARM					
NETWORK SETUP						
Ethernet Configurator	ENABLED					
IP Address	192.168.0.10					
Subnet Mask	255.255.255.0					
ADVANCED WEIGHT OPTIONS						
Weight Filter	5					
Max Tare Offset (lbs)	1					
Wt/Sec Filter	1					
% Above batch size for max weight	25					
Time to settle hopper after batch dumped	5					
Simulator	Simulator off					
Weight Data Printing	Don't Print Weight Data					

Model Number	150	500	900	2500	4000	6000
ALL WEIGHT VALUES RECORDED IN POUNDS						
(DIVIDE BY 2.20462 FOR KILOGRAMS)						
FEED ALGORITHM OPTIONS						
Hop1 Initial % of Target			99			100
Hop2 Initial % of Target	99			98		
Hop3 Initial % of Target			99			100
Hop4 Initial % of Target	99			98		
Hop5 Initial % of Target	99			98		
Hop6 Initial % of Target	99			98		
Hop7 Initial % of Target	99			98		
Hop8 Initial % of Target	99			98		
Hop1 Allowed Underfeed (lbs)	0.001		0.015		0.03	
Hop2 Allowed Underfeed (lbs)	0.001		0.004		0.01	
Hop3 Allowed Underfeed (lbs)	0.001		0.015		0.03	
Hop4 Allowed Underfeed (lbs)	0.001		0.004		0.01	
Hop5 Allowed Underfeed (lbs)	0.001		0.004		0.01	
Hop6 Allowed Underfeed (lbs)	0.001		0.004		0.01	
Hop7 Allowed Underfeed (lbs)	0.001		0.004		0.01	
Hop8 Allowed Underfeed (lbs)	0.001		0.004		0.01	
Double Gate Threshold			5			
Out of Material Retry limit before alarm			10			
Batches for process rate			10			
Process Rate Filter			3			
"Initial Target %" and "Allowed Underfeed" values assume stroke limiters installed						
in hoppers #2 & #4 & #5 thru #8						
FEED CAL OPTIONS						
Hop1 Batch % for feeder cal			25			
Hop2 Batch % for feeder cal		10			25	
Hop3 Batch % for feeder cal		10			25	
Hop4 Batch % for feeder cal		10			25	
Hop5 Batch % for feeder cal			10			
Hop6 Batch % for feeder cal			10			
Hop7 Batch % for feeder cal			10			
Hop8 Batch % for feeder cal			10			
MECHANICAL OPTIONS						
Hop1 Gate Cycle Time	0.01		0.05		0.10	
Hop2 Gate Cycle Time	0.01		0.05			
Hop3 Gate Cycle Time	0.01	0.10	0.05		0.10	
Hop4 Gate Cycle Time	0.01		0.05			
Hop5 Gate Cycle Time	0.01		0.05			
Hop6 Gate Cycle Time	0.01		0.05			
Hop7 Gate Cycle Time	0.01		0.05			
Hop8 Gate Cycle Time	0.01		0.05			
Hop1 Settle Time			3			
Hop2 Settle Time			3			
Hop3 Settle Time			3			
Hop4 Settle Time			3			
Hop5 Settle Time			3			
Hop6 Settle Time			3			
Hop7 Settle Time	3		4			
Hop8 Settle Time	3		4			
Loadcells	1 Loadcell		2 Loadcells			
Mixer Bump Time to Detect high level			0.25			
Number of Hoppers for display			SEE ORDER			
"Gate Cycle Time" values assume stroke limiters installed						
in hoppers #2 & #4 & #5 thru #8						
FEEDER SETUP						
Hop1 Feeder Type			VIRGIN			
Hop2 Feeder Type			ADDITIVE			
Hop3 Feeder Type			REGRIND			
Hop4 Feeder Type			ADDITIVE			
Hop5 Feeder Type			ADDITIVE			
Hop6 Feeder Type			ADDITIVE			
Hop7 Feeder Type			ADDITIVE			
Hop8 Feeder Type			ADDITIVE			
LOADCELL CALEX MODULE DIPSWITCH SETTINGS						
Switches set to "ON" position			#1 & #2			
SPECIAL NOTES						
2 - Component Blenders with R.A.M. - Consult Engineering						

7-5   Mitsubishi Communications Manual

The Mitsubishi blender uses a FX-2N processor that communicates with the outside world using MELSEC FX protocol over Ethernet hardware. It's Ethernet speed is 10 Mbits/second. The blender must be purchased from ACS with the Ethernet option. If this was not done at the time of purchase it can be added afterwards by consulting the factory. The blender has a programmable IP address and subnet mask that can be programmed from software that is provided by DIGI for the Ethernet module (refer to their manual).

Ethernet is the standard that we support, but Mitsubishi also supports Profibus and MELSEC Serial communications. Refer to Mitsubishi for parts and information.

The communications port settings on the PLC are: 19,200 baud; 8 data bits; no parity;1 stop bit; software flow control.

The communications must also be enabled. From the main screen touch the "next" button to go to the "inventory" page. Touch "Log in" and type in "5413". Then touch the "ACS logo" and this will take you to setup. Touch the "Network Setup" button and ensure that communications is enabled. If it wasn't then you'll need to change it and then reboot the PLC for it to take effect. The Ethernet module takes about 45 seconds to regain communications upon boot.

Below are the items that can be accessed for the blender:

Note: ITEMS MARKED (R) ARE READ ONLY AND ITEMS MARKED (RW) ARE READ/WRITE

GENERAL BLENDER INFO

1 (R) plc_version,D1942,SHORT VALUE (xx.x)

2 (R) number_of_hoppers,D1702,SHORT VALUE (number of hoppers on the blender)

3 (R) maximum_blender_throughput,D1056,LONG VALUE(maximum rate blender can achieve)

4 (R) average_batch_time, D1938,SHORT VALUE (average amount of time it takes to finish the batch)

5 (R) average_process_rate,D1334,LONG VALUE (average rate at which the process is consuming blended material)

BLENDER STARTING AND STOPPING

1 (R) blender_started,M500

2 (RW) blender_start_request,M540 (toggle this to start or stop the blender, blender will switch it's current status, you must also reset this bit after completion)

3 (RW) abort_batch_request,M508 (toggle this to immediately stop the blender even if the batch is incomplete, you must also reset this bit after completion)

BLENDER ALARMS

1 (R) alarm_number,D1876 (see below for description)

2 (R) hop1_out_of_material,M561

3 (R) hop2_out_of_material,M562

4 (R) hop3_out_of_material, M563

5 (R) hop4_out_of_material, M564

6 (R) hop5_out_of_material, M565

7 (R) hop6_out_of_material, M566

8 (R) hopper_over_max_alarm,M570

9 (R) empty_weight_exceeded,M571

10 (R) inventory_cleared,M572 (use this bit to record when an operator cleared the inventory at the blender)

11 (R) power_interruption,M576 (this alarm engages when the PLC loses power during a batch)

12 (R) hop1_low_level,M618 (this alarm is only available if the hoppers have low level prox switches)

13 (R) hop2_low_level,M619 (this alarm is only available if the hoppers have low level prox switches)

14 (R) hop3_low_level,M620 (this alarm is only available if the hoppers have low level prox switches)

15 (R) hop4_low_level,M621 (this alarm is only available if the hoppers have low level prox switches)

16 (R) hop5_low_level,M622 (this alarm is only available if the hoppers have low level prox switches)

17 (R) hop6_low_level,M623 (this alarm is only available if the hoppers have low level prox switches)

18 (R) plc_battery_low,s:M743

INVENTORY INFO

1 (RW) clear_inventory,M503 (toggle this to clear all inventory, you must also reset this bit after completion)

2 (RW) batch_counter,D1336,LONG VALUE (number of batches made)

3 (R) hop1_inventory,D1274,LONG VALUE (this is the whole portion of the inventory)

4 (R) hop2_inventory,D1276,LONG VALUE (this is the whole portion of the inventory)

5 (R) hop3_inventory,D1278,LONG VALUE (this is the whole portion of the inventory)

6 (R) hop4_inventory,D1280,LONG VALUE (this is the whole portion of the inventory)

7 (R) hop5_inventory,D1282,LONG VALUE (this is the whole portion of the inventory)

8 (R) hop6_inventory,D1284,LONG VALUE (this is the whole portion of the inventory)

9 (R)batch_inventory,D1344,LONG VALUE (this is the whole portion of the inventory)

10 (R) hop1_fractional_inventory,D1306,LONG VALUE (this is the fractional part of the inventory .xxx)

11 (R) hop2_fractional_inventory,D1308,LONG VALUE (this is the fractional part of the inventory .xxx)

12 (R) hop3_fractional_inventory,D1310,LONG VALUE (this is the fractional part of the inventory .xxx)

13 (R) hop4_fractional_inventory,D1312,LONG VALUE (this is the fractional part of the inventory .xxx)

14 (R) hop5_fractional_inventory,D1314,LONG VALUE (this is the fractional part of the inventory .xxx)

15 (R) hop6_fractional_inventory,D1316,LONG VALUE (this is the fractional part of the inventory .xxx)

16 (R) batch_inventory_decimal_part,D1352,LONG VALUE (this is the fractional part of the inventory .xxx)

RECIPE INFO (THIS IS WHERE YOU RIGHT THE NEW RECIPE TO)

1 (RW) temp_recipe_entry_mode,D1706, SHORT VALUE (0=percentage mode, 1=parts mode, 2=EZ mode)

2 (R) temp_batch_size_recipe_value,D1234,LONG VALUE (xxx.x lbs or kgs)

3 (RW) pv1_hop1_temp_recipe_value,D1110,LONG VALUE (xxx.xx, write your new recipe here)

4 (RW) pv1_hop2_temp_recipe_value,D1112,LONG VALUE (xxx.xx, write your new recipe here)

5 (RW) pv1_hop3_temp_recipe_value,D1114,LONG VALUE (xxx.xx, write your new recipe here)

6 (RW) pv1_hop4_temp_recipe_value,D1116,LONG VALUE (xxx.xx, write your new recipe here)

7 (RW) pv1_hop5_temp_recipe_value,D1118,LONG VALUE (xxx.xx, write your new recipe here)

8 (RW) pv1_hop6_temp_recipe_value,D1120,LONG VALUE (xxx.xx, write your new recipe here)

9 (R) pv1_recipe_error_message,D1690, SHORT VALUE(1=total not 100%, 2=feeder type error, 3=entry over 100%)

10 (R) pv1_accept_recipe_enabled,M504 (this bit goes high if a new recipe is valid)

11 (RW) pv1_accept_recipe_requested,M506 (toggle this bit to accept a valid recipe, you must also reset this bit after completion)

CURRENT RECIPE INFO (THIS IS THE RECIPE THAT IS CURRENTLY BEING MADE)

1 (R) current_recipe_entry_mode,D1688,SHORT VALUE (0=percentage mode, 1=parts mode, 2=EZ mode)

2 (R) current_batch_size_recipe_value,D1168,LONG VALUE (xxx.x lbs or kgs)

3 (R) current_hop1_recipe_value,D1150,LONG VALUE (xxx.xx, recipe value for running recipe)

4 (R) current_hop2_recipe_value,D1152,LONG VALUE (xxx.xx, recipe value for running recipe)

5 (R) current_hop3_recipe_value,D1154,LONG VALUE (xxx.xx, recipe value for running recipe)

6 (R) current_hop4_recipe_value,D1156,LONG VALUE (xxx.xx, recipe value for running recipe)

7 (R) current_hop5_recipe_value,D1158,LONG VALUE (xxx.xx, recipe value for running recipe)

8 (R) current_hop6_recipe_value,D1160,LONG VALUE (xxx.xx, recipe value for running recipe)

HIDDEN RECIPE INFO (THIS IS THE RAW RECIPE THAT WILL BE LOADED AT NEXT BATCH)

1 (R) recipe_entry_mode,D1686,SHORT VALUE (0=percentage mode, 1=parts mode, 2=EZ mode)

2 (R) batch_size_recipe_value,D1146,LONG VALUE (xxx.x lbs or kgs)

3 (R) hop1_recipe_value,D1128,LONG VALUE (xxx.xx, recipe value for running recipe)

4 (R) hop2_recipe_value,D1130,LONG VALUE (xxx.xx, recipe value for running recipe)

5 (R) hop3_recipe_value,D1132,LONG VALUE (xxx.xx, recipe value for running recipe)

6 (R) hop4_recipe_value,D1134,LONG VALUE (xxx.xx, recipe value for running recipe)

7 (R) hop5_recipe_value,D1136,LONG VALUE (xxx.xx, recipe value for running recipe)

8 (R) hop6_recipe_value,D1138,LONG VALUE (xxx.xx, recipe value for running recipe)

9 (R) recipe_target_total,D1144,LONG VALUE (xxx.xx, the is the total of hop1-hop6 from above, you must manually add this if you chose to skip the blenders error checking, you must also ensure that you are in the correct recipe_entry_mode! SEE BELOW FOR DETAILS)

RECIPE BOOK MANIPULATION

1 (RW) recipe_book_number, D2088, SHORT VALUE (select stored recipe number here)

2 (RW) load_recipe_book_recipe, M554 (toggle this to load the selected recipe, then toggle the accept recipe bit)

TARGETS VS. ACTUAL WEIGHT INFO

1 (R) print_data_now,M527 (read this tag and when it goes high record the actual weights)

2 (R) hop1_displayed_target_weight,D1078,LONG VALUE (target meter weight for batch, xxx.xxx)

3 (R) hop2_displayed_target_weight,D1080,LONG VALUE (target meter weight for batch, xxx.xxx)

4 (R) hop3_displayed_target_weight,D1082,LONG VALUE (target meter weight for batch, xxx.xxx)

5 (R) hop4_displayed_target_weight,D1084,LONG VALUE (target meter weight for batch, xxx.xxx)

6 (R) hop5_displayed_target_weight,D1086,LONG VALUE (target meter weight for batch, xxx.xxx)

7 (R) hop6_displayed_target_weight,D1088,LONG VALUE (target meter weight for batch, xxx.xxx)

8 (R) hop1_displayed_actual_weight,D1094,LONG VALUE (actual metered weight in batch, xxx.xxx)

9 (R) hop2_displayed_actual_weight,D1096,LONG VALUE (actual metered weight in batch, xxx.xxx)

10 (R) hop3_displayed_actual_weight,D1098,LONG VALUE (actual metered weight in batch, xxx.xxx)

11 (R) hop4_displayed_actual_weight,D1100,LONG VALUE (actual metered weight in batch, xxx.xxx)

12 (R) hop5_displayed_actual_weight,D1102,LONG VALUE (actual metered weight in batch, xxx.xxx)

13 (R) hop6_displayed_actual_weight,D1104,LONG VALUE (actual metered weight in batch, xxx.xxx)

Alarm Number Explanation:

The alarms are given in individual bits and are reflected in the alarm number. The alarm number is only used to drive a pop-up message and will probably not be very useful to you. If you decide to use the alarm number instead of reading the individual alarm bits then the related values are shown below:

D1876 Value	Alarm Description		
0=	NO ALARM		
1=	HOPPER 1	Out of Material	1
2=	HOPPER 2	Out of Material	2
3=	HOPPER 3	Out of Material	3
4=	HOPPER 4	Out of Material	4
5=	HOPPER 5	Out of Material	5
6=	HOPPER 6	Out of Material	6
7=	POWER INTERRUPTION while metering a Batch		
8=	PLC BATTER LOW	Check PLC and Configure the Blender	
9=	MAX HOPPER WEIGHT EXCEEDED. CHECK BATCH SIZE		
10=	CALIBRATION ERROR. Clean out weigh hopper and check calibration		
12=	HOPPER 1	Low Level	
13=	HOPPER 2	Low Level	
14=	HOPPER 3	Low Level	
15=	HOPPER 4	Low Level	
16=	HOPPER 5	Low Level	
17=	HOPPER 6	Low Level	

FIXED DECIMAL EXPLANATION

All weight values and recipe values use fixed decimal. This must be taken into consideration when writing or reading values. If you see "xxx.xxx" above this means the data is in fixed decimal and must be scaled when reading or writing. A decimal is shown next to each item to represent the format.

WRITING RECIPE EXPLANATION

To write a recipe you must first write to the "temp recipe" value locations above. After this is complete you should read the "accept recipe enabled" and the "recipe error" values. If you have a recipe error then you should display the appropriate text. If the "accept recipe enabled" is high then show a button that will then write to "accept recipe" bit. This will load in the recipe. You do not need to check the sum of the recipe that they've entered. The blender will do that for you.

> **Note:** **If you chose to write the recipe to the raw recipe locations you run the risk of inadvertently entering the incorrect recipe. This is not recommended because it will bypass all the checks that the blender makes before letting you hit "accept new recipe". Also if you chose to use the raw method then you must add up the totals for your recipe and write that at the exact same time that you write the other raw recipe values. You must also right the batch size and recipe entry information or the blender might not make a batch.**

RECORDING THE TARGETS VS. ACTUALS FOR EACH BATCH

The targets that are read are in lbs or kgs. When a batch is complete and dumped the blender will toggle high the "print data now" bit. At this time you should then read the "actual displayed weights" values and record them into a log or chart. If you are not getting the "print now" bit, then refer to the blender manual to configure "print batch data".

> **Note:** **WHEN THE BLENDER IS NOT RUNNING THE "TARGET" VALUES GET SET TO "999999999" AND IN THE BEGINNING OF EACH BATCH ALL ACTUAL VALUES GET SET TO "999999999" UNTIL THE HOPPER FEEDS MATERIAL INTO THE NEW BATCH.**

7-6   Technical Assistance

Parts Department

Call toll-free 7am–5pm CST [800] 423-3183 or call [810] 720-7300; Fax [810] 720-2598

The ACS Customer Service Group will provide your company with genuine OEM quality parts manufactured to engineering design specifications, which will maximize your equipment's performance and efficiency. To assist in expediting your phone or fax order, please have the model and serial number of your unit when you contact us. A customer replacement parts list is included in this manual for your convenience. ACS welcomes inquiries on all your parts needs and is dedicated to providing excellent customer service.

Service Department

Call toll-free 8am–5pm CST [800] 423-3183 or call [810] 720-7300
Emergencies after 5pm CST, call [847] 439-5655

We have a qualified service department ready to help. Service contracts are available for most of our products.
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Sales Department

Call [810] 720-7300 Monday–Friday, 8am–5pm CST

Our products are sold by a world-wide network of independent sales representatives. Contact our Sales Department for the name of the sales representative nearest you.

Contract Department

Call [810] 720-7300 Monday–Friday, 8am–5pm CST

Let us install your system. The Contract Department offers any or all of these services: project planning; system packages including drawings; equipment, labor, and construction materials; and union or non-union installations.